

Safe Per Urethral Catheterization: Standard Operational Procedures

Prof. Krishna Kaji Bhomi



COI Disclosure Information

No COI with regard to this presentation

What is unsafe?

- Infection
- Injury

Bleeding
Pain

Psychological
trauma

Medicolegal
issue

Wrong
patient

Paraphimosis

Latex/lignocaine allergy

Rationale

- Catheter-associated urinary tract infection (CAUTI) and bloodstream infection (CABSI) are leading causes of healthcare-associated infection in England's National Health Service (NHS)
 - D R M Smith et al. Epidemiology and health-economic burden of urinary-catheter-associated infection in English NHS hospitals: a probabilistic modelling study. *J Hosp Infect.* 2019;103(1):44-54
- 11% of urethral strictures requiring urethroplasty arise following urethral catheterization.
 - Lumen N et al. Etiology of urethral stricture disease in the 21st century. *J Urol* 2009;182(3):983-7



American
Urological
Association



Who Can Catheterize?



- A person who
 - Know the anatomy of the genitourinary tract to prevent urinary catheter insertion errors and patient injury
 - Know the principles of asepsis and sterile technique that are applied when inserting a urinary catheter
- A registered nurse (RN), doctor or HCP adequately trained and deemed competent can perform a urethral catheterization
 - [NHS guideline](#)

Nepal Medical Council Guidelines

3 (d) Demonstration of adequate skills in performing the following procedures: For example;

MEDICINE

Endotracheal intubation and CPR
Venepuncture
IM injections
Catheterisation of the bladder

Pleural aspiration
Peritoneal aspiration
Blood film for MP
Bleeding time, clotting time



Indications

- CDC Criteria for Indwelling Urinary Catheter Insertion:
 - Acute urinary retention or bladder outlet obstruction
 - To improve comfort for end-of-life care if needed
 - Critically ill and need for accurate measurements of I&O (e.g., hourly monitoring)
 - Selected surgical procedures (GU surgery/colorectal surgery)
 - To assist in healing open sacral or perineal wound in the incontinent patient
 - Need for intraoperative monitoring of urinary output during surgery or large volumes of fluid or diuretics anticipated
 - Prolonged immobilization (potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures)

Contraindications

- Acute prostatitis
- Suspicion of urethral injury



Alternatives



- An indwelling catheter should only be placed when there is a clear indication. It should not stay in place longer than necessary.
- First consider alternatives before placing an indwelling catheter
 - Male external catheter
 - Intermittent catheterization
 - Contenance pad / containment product

Consent



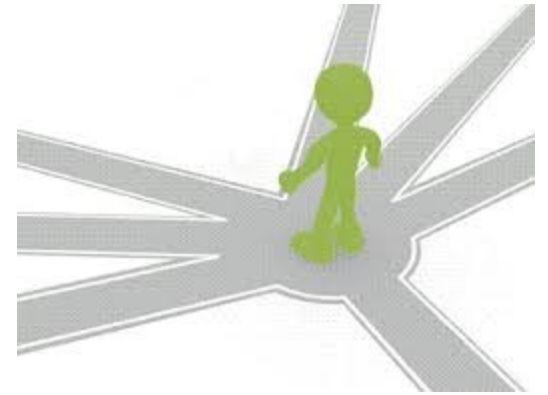
- Catheterization is an invasive procedure that can cause embarrassment, physical and psychological discomfort
- Informed verbal consent
- Should be documented

What you need to explain?

- Indication, what happens if not done
- Alternative
- Explain the procedure, steps involved
- Risk/complications
- Aftercare

Prerequisites

- Privacy
- Chaperone: Compulsory
- A helping hand
- No visitor



Checklist



- Confirm indication
- Counselling and consent
- Privacy and chaperone
- Materials:
 - 1. ...
 - 2. ...
 - 3. ...
- Reassurance
- Documentation

European Association of Urology Nurses: Urethral catheterisation – insertion procedure: Male

Action	Rationale
1. Check patient file for past problems, allergies etc.	To ensure the patient understands the procedure.
2. During the procedure explain the process to the patient.	Consent
3. a) Undertake procedure on the patient's bed or in clinical treatment area using screens/ curtains to promote and maintain dignity b) Assist the patient to get into the supine position to ensure the penis is accessible c) Do not expose the patient at this stage of the procedure.	To ensure patient's privacy. To maintain patient's dignity procedure and comfort.
4. Wash hands using soap and water or bactericidal alcohol hand rub.	To reduce risk of infection.
5. Clean and prepare the trolley, 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 outer cover of the catheterisation pack and slide the pack onto the top shelf of the trolley.	To prepare equipment.

8. Using an aseptic technique, connect the bag to the catheter at this stage.	To reduce the risk of cross infection.
9. Remove cover that is maintaining the patient's privacy and position a disposable pad under the patient's buttocks and thighs.	To ensure urine does not leak onto bed.
10. Clean hands with a bactericidal alcohol hand rub.	Hands may have become contaminated by handling the outer packs.
11. Put on gloves.	To reduce risk of cross infection.
12. Place dressing / protective towel across the patient's thighs and under penis.	To create a protective field.
13. Lift the penis and retract the foreskin if present using a gauze swab and clean the glans penis with the solution. Beginning with the foreskin, the glans and urethral meatus at the end. Use a new swab for each part.	Lifting the penis straightens the penile urethra and facilitates catheterisation. To reduce the risk of introducing infection. [185]
14. Replace existing gloves with a sterile pair.	To prevent infection.

15. Slowly instill 10-15 ml of the (anaesthetic) lubricating gel into the urethra holding the penis firmly below the glans with thumb and fingers and the tip of the syringe firmly in the meatus to prevent the gel from leaking out.

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.

16. Remove the syringe tip from the urethra and keep the urethra closed. Alternatively, a penile clamp may be used.

To ensure that the gel stays in the urethra.

17. Wait as recommended on the product (3 to 5 min.)

To ensure a maximised anaesthetic effect. [65, 68, 69, 71, 186]

18. Advance the catheter gently to the bifurcation. Hold the penis all the time upright with traction of the other hand (if no urine drains gently apply pressure over the symphysis pubis area.

Advancing the catheter ensures that it is correctly positioned in the bladder. [75, 187, 188]

19. Slowly inflate the balloon according to the manufacturer's direction, having ensured that the catheter is draining urine beforehand.

Inadvertent inflation of the balloon in the urethra causes pain and urethral trauma. [63, 187]

20. Withdraw the catheter slightly.

Withdrawing the catheter ensures the balloon sits at the bladder base ensuring optimal urine drainage.

21. Secure the catheter using a support strap. Ensure that the catheter does not become taut when patient is mobilising or when the penis becomes erect. (For Stabilisation of urethral catheter see 6.5.5)

To maintain patient comfort and to reduce the risk of urethral and bladder neck trauma.

22. Ensure that the glans penis is cleansed after the procedure and reposition the foreskin if present.

Retraction and constriction of the foreskin behind the glans penis resulting in paraphimosis may occur if this is not done. [65]

23. Help the patient into a comfortable position. Ensure that the patient's skin and the bed are both dry.

If the area is left wet or moist, secondary infection and skin irritation may occur.

24. Measure the amount of urine.

To be aware of bladder capacity for patients with previous occurrences of urinary retention. To monitor renal function and fluid balance. It is not necessary to measure the amount of urine if the patient is having the urinary catheter routinely changed.

25. Take a urine specimen for laboratory examination, if required.

To rule out urinary tract infection.

<p>26. Dispose of equipment in a plastic clinical waste bag and seal the bag before moving the trolley.</p>	<p>To prevent environmental contamination.</p>
<p>27. Record information in relevant documents, this should include:</p> <ul style="list-style-type: none">• reasons for catheterisation• date and time of catheterisation• catheter type, length and size.• amount of water instilled into the balloon• batch number and manufacturer• drainage system used• problems negotiated during the procedure• review date to assess the need for continued catheterisation or date of change of catheter.	<p>To provide a point of reference or comparison in the event of later queries.</p>
<p>28. Record patient experience and any problems. See Chapter 12</p>	<p>To provide a point of reference or comparison in the event of later queries.</p>

European Association of Urology Nurses: Urethral catheterisation – insertion procedure: Female

Action	Rationale
Until point 12 the procedure is the same as for male catheterisation.	
13. Place dressing / protective towel under the patient.	To create a protective field.
14. Put on gloves	To reduce risk of cross infection.
15. Clean the meatus: labia majora, then the labia minor and finally the urethral meatus. One swab – one wipe anterior to posterior.	To avoid wiping any bacteria from the perineum and anus forwards towards the urethra.
16. Put on sterile gloves.	To prevent infection.
17. Separate the labia with one hand and give traction upwards.	To have a good view on the meatus and to minimise the risk of contamination of the urethra.
18. Apply a little lubrication to the meatus and then insert the cone of the syringe with (anaesthetic) lubrication in the meatus and slowly instill 6 ml of the gel into the urethra. Then remove the nozzle from the urethra.	Adequate lubrication helps to prevent urethral trauma. Use of a local anaesthetic minimises the discomfort experienced by the patient and can add to the success of the procedure.

<p>19. Pick up the catheter with the hand with the sterile glove. Insert the catheter in the meatus and gently advance the catheter along the urethra until it reaches the bladder and urine flows out. Then insert the catheter 2 cm deeper.</p>	<p>Inadvertent inflation of the balloon in the urethra causes pain and urethral trauma [63, 187]</p> <p>To be sure that the balloon is in the bladder.</p>
<p>20. Withdraw the catheter slightly.</p>	<p>Withdrawing the catheter ensures the balloon sits at the bladder base ensuring optimal urine drainage.</p>
<p>21. If the patient desires secure the catheter using a support strap. Ensure that the catheter does not become taut when patient is mobilising.</p>	<p>To maintain patient comfort and to reduce the risk of urethral and bladder neck trauma.</p>
<p>22. Ensure that the labia are cleaned after the procedure.</p>	<p>To avoid skin irritation.</p>
<p>23. Help the patient into a comfortable position. Ensure that the patient's skin and the bed are both dry.</p>	<p>If the area is left wet or moist, secondary infection and skin irritation may occur.</p>
<p>24. The same procedure as in men from point 27 et seq.</p>	

Catheter related injury

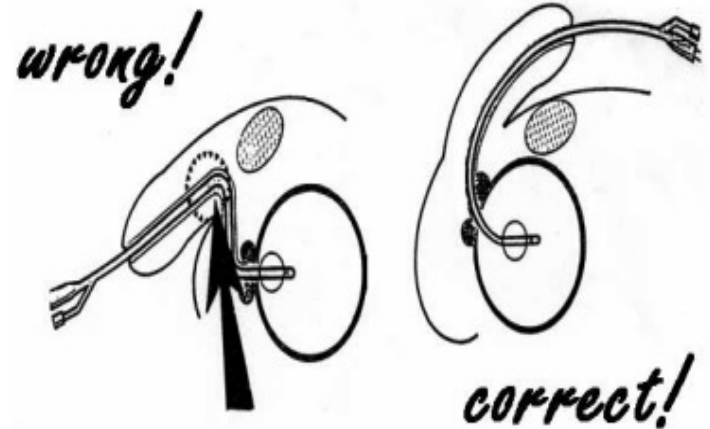
- During insertion
 - False passage
 - Urethral rupture
- Post catheterization
 - Paraphimosis
 - Urethral erosion/cleaving

How can we prevent urethral injury?

- Use smallest diameter catheter
 - Gould CV et al. Guideline for prevention of catheter-associated urinary tract infections 2009. December 2009
- Do not force
- Secure urinary catheters

Securing the urethral catheter

- Reduces accidental pulling or dislodgment
- Best-practice models recommend securing the catheter to the upper thigh on a woman and on the abdomen for a man
- Abdominal stabilization prevents necrosis at the urethral penile-scrotal junction caused by prolonged catheter pressure



— Newman DK. Incontinence products and devices for the elderly. *Urol Nurs.* 2004;4(3):316–334

Urethral rupture

- Why?
 - Inadvertent inflation of balloon in urethra
- How to prevent?
 - Insert full length of catheter
 - Confirm full length is inside just before inflating balloon



Decompression hematuria: Is it a concern?

- Occurs in 2–16% of patients following quick, complete relief of urinary obstruction
 - Nyman MA et al. Management of urinary retention: rapid versus gradual decompression and risk of complications. *Mayo Clin Proc.* 1997;72(10):951–6
- RCT: 294 patients: No significant difference in the incidence of hematuria following rapid vs. gradual bladder emptying (10.5% vs. 11.3%)
 - Boettcher S et al. Urinary retention: benefit of gradual bladder decompression - myth or truth? A randomized controlled trial. *Urol Int.* 2013;91(2):140–4.
- Most cases of decompression hematuria are mild and usually self-limiting

Balloon: Sterile water or saline?

- Ideal solution: Sterile water
 - Shaunita J. et al. Optimal filling solution for silicone Foley catheter balloons. *Can Vet J* 2011 Oct; 52(10): 1111–1114
- Using fluid other than sterile water may cause the balloon not to empty properly, especially after long dwell times.
 - [Bard® Foley Catheter Inflation/ Deflation Guidelines](#)
- Joson H. Can normal saline be used to fill the balloon of a Foley catheter? The experience of a prospective randomized study in China. *Int J urol* 2004 Oct;11(10):845-7.
 - 4000 catheters 4 weeks inflation in vitro at 37 degree
 - Failure rate of deflation: no significant difference

Pretesting the balloon?

- Must be based on manufacturer's recommendations
- Bard indicate pretesting is not necessary since they pretest each Foley catheter before it is packaged
- Pretesting silicone balloons can form a cuff or crease at the balloon area that can cause trauma to the urethra during catheter insertion and is not recommended
 - Parkin J et al. Urinary catheter 'deflation cuff' formation: clinical audit and quantitative in vitro analysis. *BJU* 2002; 90(7): 666-671.

Antibiotic prophylaxis?

- Low-quality evidence suggested no benefit of antimicrobial prophylaxis in patients undergoing short-term catheterization
 - [CDC guideline](#)
- Antimicrobial prophylaxis is not currently recommended during urethral catheterization for patients at risk of infective endocarditis
 - [AHA and NICE guidelines](#)

Removal of urethral catheters

- Confirm indication
- Indwelling catheters should be removed early in the morning so that any retention problems can be dealt with during the day

Balloon deflation


- Manual syringe aspiration results in the formation of creases and ridges, and an increase in catheter balloon diameter size on deflation
- Syringe aspiration should not be used when deflating catheter balloon, passive deflation should be allowed
 - John R, Deflation of a Foley catheter balloon; *Nurs Stand* 2003 Mar;17(27):33-8

Clamping or not?



- The intermittent clamping prior to removal of catheter has been suggested on the basis that this simulates normal filling and emptying of the bladder

BMJ Open Need to clamp indwelling urinary catheters before removal after different durations: a systematic review and meta-analysis

Sumin Ma ,¹ Jiayi Gu,² Xiaoyan Fan³

- Bladder training by clamping indwelling urinary catheters increases the incidence of UTI and lengthens the hours to first void in patients with indwelling urinary catheters use durations of ≤ 7 days compared with the free drainage
- However, the effect of clamping training on patients with an indwelling urinary catheter use duration of > 7 days is unclear

Document



- Date and time
- Indication
- Counseling /consent
- Size and type of catheter used
 - Batch no, expiry date, manufacturer
- Amount of water in balloon
- Procedure: Uneventful/problems
- Volume of urine drained
- Explanation of catheter care to patient

Audit



- Hospitals should conduct routine audits of catheter insertions and adverse events
 - To provide feedback to staff on their technique
 - Quality improvement strategy
 - A road to ensuring safe catheterization

Thank
you