Self-Directed Learning Package
Insertion and Management of Indwelling Urethral Catheters

For Registered and Enrolled Nurses

Name: ________________________________________________

Work Area: ________________________________________________

Date: ________________________________________________

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1 VCISS1 Effective: June 2017 Review: July 2018 Acknowledgement to TPCH Urology CNC – package adapted to contextualise to CISS
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Objectives of the learning package

1. Demonstrate competence in male and female urethral catheterisation.
2. Understand the indications for urethral catheterisation.
3. Be aware of the implications for antibiotic prophylaxis.
4. Have knowledge of contemporary infection control principles for the insertion and maintenance of the closed urinary drainage system.
5. Describe the anatomy of the male and female lower urinary tract.
6. Understand the characteristics of urine.
7. Be aware of lower urinary tract disorders that may affect urethral catheterisation.
8. Discuss the difference between acute and chronic urinary retention and identify five causes of acute urinary retention
10. Identify the following:
    
    • Type of solution used to clean the urethral meatus prior to catheter insertion
    • Size of catheter routinely used in a male and female patient
    • The consequences of balloon under and over inflation
    • The solution to be used for balloon inflation
    • When different types of catheter should be changed

11. Apply knowledge about the type of catheter to be used and infection control principles to the insertion of an indwelling urinary catheter.
12. Discuss the nursing care of a patient with an indwelling catheter.

Introduction

This learning package has been formulated to provide the requisite theoretical knowledge to attain competency in the clinical skills required for the:

• Insertion of indwelling urinary catheters in both males and females;
• Appropriate care of a patient with an indwelling catheter.
Process for Competency

To enable the nurse to become competent in the skill of urethral catheterisation the following process must be followed.

1. Identify that urethral catheterisation skill is required in their clinical area of practice.
2. Identify that the nurse undertaking this training and assessment will be able to maintain competency by regularly performing this skill in their clinical area of practice.
3. Nurse completes this self-directed learning package (SDLP).
4. Following completion of this SDLP, the Nurse undertaking training and assessment:
   a. Observes another competent staff member performing urethral catheterisation on a male and female patient.
   b. Then performs a minimum of 3 urethral catheter insertions successfully under the supervision of a competent staff member. A competency assessment form must be completed for each procedure. (Competency assessment forms are located at the back of this SDLP).
5. Discuss any further training needs or additional competency assessments with the Nurse Educator or Registered Nurse competent in the procedure.
6. Complete and sign the competency statement with the Nurse Educator.
7. Where competency has not been attained after 5 attempts discuss further training requirements with the responsible line manager.

Nursing staff must always work within their “Scope of Professional Practice” and are required to demonstrate initial and continuing competence (Framework for assessing standards for practice for Registered Nurses, Enrolled Nurses and Midwives 2013). The responsibility to maintain safe practice and demonstrate competence in IDC insertion, care and maintenance belongs to the individual nurse. Therefore, each individual is to identify additional learning required or reassessment of their competence to maintain a standard of care.
Overview

Urethral catheterisation of the bladder requires the introduction of a tube into the bladder via the urethra. The purpose of an indwelling catheter is to allow continuous drainage of urine when the patient is not in a position to control micturition or when there is an obstructed path to the flow of urine or when monitoring of urine output is required.

Insertion of a urinary catheter carries a risk of trauma to the lower urinary tract especially in the male patient. Knowledge of the anatomy of the lower urinary tract is required prior to insertion of a urethral catheter to prevent trauma and complications.

Acquired catheter associated urinary tract infection is the most common hospital acquired infection worldwide (Loveday et al., 2014; Hooton et al., 2009). Contemporary infection control principles when caring for urinary catheters can significantly reduce the morbidity and cost associated with hospital acquired urinary tract infections.

A thorough risk assessment of the patient’s need for a urinary catheter before the procedure is always required and should include:

- Establishment of urological conditions that may make catheterisation difficult
- Previous catheterisation or urology surgery
- Abnormal genitourinary anatomy
- Informed consent and confirmation of allergy status
- Documented Medical order for catheterisation
- Assessment for antibiotic prophylaxis prior to the procedure

Antibiotic Prophylaxis for catheter insertion

Antibiotic prophylaxis when inserting or changing catheters is indicated in patients with a history of catheter associated infection after catheter change, or patients who have a heart valve lesion, septal defect, patent ductus or prosthetic heart valve (Rathnayake, 2010). Antibiotic prophylaxis may also be ordered for patients who have undergone a recent joint replacement or other surgery as ordered by the responsible medical team.
Indications for the insertion of an indwelling urethral catheter

There are a number of reasons for inserting an indwelling catheter and these include:

✓ Prevention of skin breakdown in patients with incontinence of urine;
✓ Patients with acute bladder distension following trauma;
✓ Ordered for collecting sterile specimen (especially if patient is incontinent & suspected to have UTI symptoms);
✓ Strict input-output monitoring (strict titration of diuretics is monitored in Heart failure);
✓ Monitoring of urine output or providing bladder drainage;
✓ Bladder Outlet Obstruction - prostate enlargement or urethral stricture;
✓ To assist in the drainage of gross haematuria and blood clots from the urinary bladder;
✓ Bladder irrigation (post-traumatic removal of IDC e.g., patient with cognitive impairment pulled out the IDC with inflated balloon);
✓ Patients undergoing a surgical repair to the urethra, bladder and/or surrounding structures;
✓ Instillation of drugs (Intravesical);
✓ Patients who develop acute post-operative retention of urine;
✓ Following the effects of sedatives and/or analgesics in the post-surgical or post trauma phase;
✓ Some types of spinal cord injuries.

Intermittent catheterisation (IC) is preferred in some circumstances over inserting an indwelling catheter. Indications for intermittent catheterisation include:

- To obtain a sterile urine specimen;
- To assess post void residual volume (ultrasound bladder scan is first choice);
- Long term management to drain the bladder due to bladder outlet obstruction, detrusor failure, stricture disease and interrupted nerve innervation in some types of spinal cord injuries and poorly contractile bladders.
Anatomy of the Urinary Tract

The urinary tract consists of two kidneys, two ureters, a urinary bladder and a urethra. Blood is filtered through the kidneys by a process called glomerular filtration (GFR) which in turn produces urine. Urine contains dissolved substances (solutes) and is usually a pale yellow colour. For a graphic demonstration go to one or more of these websites:

| National Institute of Diabetes and Digestive and Kidney Diseases | YouTube How your kidneys work https://youtu.be/FN3MFhYPWWo By Emma Bryce |

Urinary Bladder

Urine is transported from the kidneys to the urinary bladder via the ureters. The urinary bladder is a hollow muscle or reservoir that has the capacity to stretch and hold 350 – 700 mls of urine. If the bladder becomes over stretched it can hold up to 1500 mls, this is known as chronic retention.

The bladder wall is lined with mucous membrane and is continuous with the lining of the urethra. The mucous membrane is surrounded by three layers of smooth muscle, collectively known as the detrusor muscle. Contraction of these muscles forces urine out of the bladder.

Near the urethral opening in the bladder, circular muscle fibres form an internal sphincter (ring of muscle). This sphincter is under involuntary control. The trigone, which is triangular in shape, is located in the base of the bladder. The points of the trigone are the three openings into the bladder – 2 ureteric orifices and 1 urethra at the bladder neck.

The bladder is located retroperitoneal in the pelvic cavity posterior to the pubic symphysis. With the accumulation of urine the bladder will expand and rise into the abdominal cavity.

The female urethra is 3 to 5cm long is slightly curved and lies anterior to the vagina. The female urethra is short in comparison to the male urethra and the close proximity to the anus and the vagina allow easy migration of micro-organisms that can cause urinary tract infections.

The urethral meatus is positioned medial to the labia minora and distal to the clitoris as shown in the diagram. The vagina is in close proximity to the urethral meatus and identification of the opening can be difficult in obese patients and those who have a degree of vaginal atrophy causing retraction of the meatus towards the vagina. Distal urethral lesions (caruncle) are commonly found in the post-menopausal women and may appear as tissue projecting from the meatal opening. Certain types of gynaecological surgery can also alter the appearance of the female genitalia.
Circular muscle fibres form the external sphincter near the external opening of the urethra (urethral meatus) in the female. This sphincter is under voluntary control, allowing the bladder to fill until we decide we want to urinate.

**Male Genitourinary Tract**

[Image of the male genitourinary tract]


*Web page accessed on 01/07/2015*

The male urethra is approximately 20 to 25 cm long and has 3 main parts, penile, bulbar and prostatic urethra. Anatomically the male urethra has an “S” shaped double bend. The urethra transports urine but also forms part of the male reproductive system and carries seminal fluid during ejaculation.

The meatal opening is usually at the tip of the glans penis which is covered by the foreskin. Altered anatomy such as hypospadias (urethral opening on the
underside of the penile shaft), retracted penis in obese patients and phimosis (tight foreskin) can make catheter insertion difficult.

The prostate gland is a gland of the male reproductive system. It is shaped like a chestnut and secretes a milky substance in the ejaculate. The seminal vesicles also contribute fluid to the ejaculate; they are about 5cms long and are located posterior to the bladder just above the prostate gland. In males the external sphincter sits just below the prostate gland and is usually where resistance is felt during catheterisation. Gentle pressure, asking the patient to relax or cough can help relax the sphincter and allow the catheter to pass through into the bladder.

**Characteristics of urine**

Freshly voided urine is generally clear and from a pale to deep yellow in colour. The more solutes (dissolved substances) there are in the urine, the deeper yellow its colour; dilute urine is a pale, straw colour. Certain foods and medications may cause colour change in the urine. When formed, urine is sterile and is usually slightly acidic. Since urine is water plus solutes, urine weighs more, or is denser than distilled water.

Urine output is directly affected by renal perfusion and the Glomerular Filtration Rate (GFR). In an adult the minimum urine output is 0.5ml – 1ml per kg per hour, so for an 80kg patient the minimum urine output would be 40mls – 80mls per hour. Urine output is also used as an indicator to help identify the deteriorating patient who may have poorly perfused kidneys and may require treatment for low blood pressure, dehydration or electrolyte imbalance.

With certain diseases, urine composition can change dramatically, and the presence of abnormal substances in urine is often helpful in diagnosing the problem. Substances not normally found in urine are glucose, blood proteins (primarily albumin), red blood cells, haemoglobin, white blood cells, acetone, pus and bile.

Haematuria can be either microscopic or macroscopic and is associated with either trauma or an underlying disease process. Anticoagulant therapy will increase the risk of catheter associated haematuria following the procedure.
Disorders of the lower urinary tract

Urinary retention

Urinary retention is a condition where the bladder is unable to expel the stored urine. There are many causes of urinary retention. It is common after anesthesia and surgery, with a reported incidence of between 5% and 70% (Baldini, et, al., 2009).

In males another cause can be benign prostatic hyperplasia (BPH) of the prostate gland – this causes the urethra to narrow making it difficult to void.

Constipation is a cause of acute and chronic urinary retention in both sexes.

Urinary retention must be treated with catheterisation to prevent bladder trauma from over distension and evidence based practice supports the complete decompression of the bladder via insertion of a urinary catheter. Patients who have chronic retention of urine will have a decompression diuresis and will often develop haematuria and require intravenous fluid replacement to prevent hypovolaemia and shock. There is no evidence to suggest that controlled decompression of the bladder will reduce these symptoms when the indwelling urinary catheter is inserted (Brian, et, al., 2010).

There are a number of disorders that are associated with the urinary system that you will need to be aware of and these include:

- Male urethral stricture disease
- Benign Prostatic Hyperplasia (BPH)
- Prostate Cancer
- Incontinence of urine
- Urinary tract infection

Male Urethral Stricture Disease

Strictures can form at any point along the male urethra and are usually as a result of injury related trauma or from bacterial or viral infections. Scar tissue formation will result in narrowing of the urethral lumen. Strictures can form at any point along the urethra with strictures at the bulbar urethra being the most common (Brandes 2008). Strictures can cause bladder outflow obstruction and symptoms of reduced urine flow and dysuria.
When inserting a urethral catheter resistance may be felt at the point of a stricture. If resistance is felt a smaller catheter may be useful. If the catheter does not advance the procedure should be abandoned and the medical team informed.

**Benign Prostatic Hyperplasia (BPH)**

The prostate gland is a walnut sized gland that sits at the base of the bladder. As men grow older the prostate gland increases in size. As it grows the prostate starts to narrow the prostatic urethra and may cause symptoms such as reduced urine flow, nocturia, urgency, leaking and dribbling. BPH can lead to acute urinary retention which is a medical emergency.

**Incontinence of urine**

Incontinence is the involuntary or uncontrolled loss of urine from the bladder and includes the following subtypes:

- **Stress**— associated with increased intra-abdominal pressure through coughing, sneezing or lifting.
- **Urge**— associated with urgency; the patient is aware of the need to urinate but is unable to reach the toilet in time.
- **Reflex**— associated with involuntary urethral relaxation due to loss of sensation, as in paraplegia.
- **Overflow**— associated with over distension of the bladder and frequent small loss of urine; the bladder does not fully empty; maybe caused by medications, strictures or prostatic enlargement.
- **Mixed**— a combination of stress and urge incontinence.

**Urinary Tract Infection**

Urinary tract infection (UTI) us tge moist common infection acquired as a result of health care (Loveday, et al., 2014). Between 15 and 25% of patients in hospital may receive short-term indwelling urinary catheters, and approximately 5% of residents in long-term care facilities (O’Grady et al 2002). Approximately 20% of Hospital Acquired Infections (HIA’s) are urinary tract infections and over half of these (56%) are catheter-associated urinary tract infections (CAUTI’s) (Loveday, et al., 2014). Up to 97% of urinary tract infections in intensive care units have been associated with indwelling catheters (Cruickshank & Ferguson, 2008).
Microorganisms can be introduced into the sterile bladder from extraluminal contamination (possible from the perineum), while intraluminal contamination can occur from reflux in the tube or from a contaminated urine collection bag (Loveday, et al., 2014).

**Urinary Catheters**

The most commonly used indwelling urinary catheter is a Foley catheter. The name comes from Frederick Foley a surgeon who designed the catheter in the 1930’s. Foley catheters have a balloon which is inflated to keep the catheter in place and have 2 or 3 lumens, one to drain urine, a second to inflate the balloon and if present a third lumen to irrigate or instil fluid into the bladder.

The French (Fr) gauge or Charriere (Ch) system is widely used to specify the size of a catheter. The larger the gauge number, the larger the catheter.

- 1F = 0.33mm therefore a size 12Ch is approximately 12mm in diameter
- Females usually require a 12Ch – 14Ch catheter
- Males usually require a 14Ch – 16Ch catheter
- *(This is a guide only.)* The catheter balloon port is colour coded; this is an international system of identifying the size of catheter that is inserted

The catheter size used should be fit for purpose, ensuring that the internal lumen is large enough to drain the type of urine expected, for example urine with clots and debris will need a larger size catheter. If too large a catheter is used, it may cause urethral irritation, discomfort and mucosal damage.

The balloon retains the catheter in the bladder and the recommended volume for inflation is printed on the balloon port and catheter packaging as indicated by the manufacturer. A usual volume for 2 way catheters is 5-10mls. Larger balloon sizes may be used following urology procedures such as prostatectomies. Under inflation of the balloon should be avoided, as this may cause distortion and the catheter may not be
properly retained in the bladder. Over inflation should also be avoided as this may result in occlusion of the drainage eyes or balloon failure.

Catheters are made from various substances including PVC, latex (with or without a coating) and silicone. Silver impregnated catheters are available and evidence suggests they may be utilized to prevent catheter associated infections but there is no conclusive evidence on which patient groups they are best utilized (Moola & Konno, 2010).

The type of material used is a major consideration when selecting the most suitable catheter in relation to the expected length of time it will be in-situ, for example:

<table>
<thead>
<tr>
<th>Catheter Type</th>
<th>Material Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermittent “in-out” catheter</td>
<td>PVC, lubricated or hydrophilic</td>
</tr>
<tr>
<td>Short term catheter (up to 4 weeks)</td>
<td>Teflon coated latex</td>
</tr>
<tr>
<td>Long term catheter (up to 12 weeks)</td>
<td>Silicone or hydrogel coated latex</td>
</tr>
</tbody>
</table>

Hydrogel coated latex catheters should be the first choice for an indwelling catheter, they are “long term” and will reduce the need for a catheter change if the catheter is to remain insitu’ for more than 4 weeks. It should be noted that these catheters should not be used for patients with a latex allergy; In this instance a 100% silicone catheter should be used.

Sterile water is routinely used for catheter balloon inflation and is well documented. The literature does not support other solutions which are thought to cause balloon failure through deflation or blockage of the balloon channel through crystallization (Loveday, et al., 2014).

**Catheter advancement and balloon inflation in the male patient**

Nursing responsibilities include

- Explanation of the procedure;
- Obtaining informed verbal consent;
- Promoting relaxation for the patient;
- Inserting the catheter;
- Identifying resistance: (often felt at the external sphincter, but can be felt at
any point along the urethra due to urethral strictures, false passages from previous catheterisations of an enlarged prostate gland). If resistance is felt at the sphincter, gentle firm pressure should be applied to help ease the catheter through the sphincter

NOTE: The catheter balloon should **NOT** be inflated until the catheter has been advanced to the bifurcation of the catheter at the balloon port as inflating the balloon in the male urethra can cause significant pain, trauma and haematuria. Prior to balloon inflation the urethra should be palpated to ensure that the catheter in not coiled in the urethra.

Following balloon inflation the catheter should be withdrawn gently to ensure it is correctly anchored at the bladder neck.

Table 1. Summary of infection control principles and procedures for Urethral catheter insertion and maintenance.

<table>
<thead>
<tr>
<th>Maintenance</th>
<th>• Use an aseptic closed system and avoid breaches to this system (e.g. unnecessary emptying of the urinary drainage bag)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Before manipulation, perform hand hygiene and put on non-sterile gloves</td>
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<tr>
<td></td>
<td>• Position drainage bag to prevent back-flow of urine or contact of bag with the floor</td>
</tr>
<tr>
<td></td>
<td>• Do not add antiseptic or antimicrobial solutions into drainage bags</td>
</tr>
<tr>
<td></td>
<td>• Empty the drainage bag frequently enough to maintain urine flow and prevent reflux</td>
</tr>
<tr>
<td></td>
<td>• Use a separate urine collection container for each patient, avoiding contact between the drainage bag and container. Following use, the container should be discarded if single use, or cleaned and sterilised if reusable</td>
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<tr>
<td></td>
<td>• Change drainage bags only when necessary (i.e. according to either manufacturers’ recommendations of the patient’s clinical needs)</td>
</tr>
<tr>
<td></td>
<td>• Clamping is unnecessary</td>
</tr>
<tr>
<td></td>
<td>• Daily meatal hygiene can be maintained through routine bathing or showering</td>
</tr>
<tr>
<td></td>
<td>• Avoid use of bladder irrigation, instillation or washouts as routine</td>
</tr>
</tbody>
</table>
Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010)

Catheter associated problems

Along with the increased risk of infection associated with a urinary catheter there are other common problems you need to be aware of that may be experienced by patients with a catheter.

- **Urethral discomfort** can be attributed to a catheter that is too large for the patient. Correct catheter choice, fixation of the catheter to the thigh using a “fixation” strap or tape will help minimize this.

- **Bladder spasm / bypassing of urine** can be experienced. Infection, incorrect catheter placement and catheter blockage should be investigated. Patients with an overactive bladder may be prescribed anticholinergic medication to help minimize the symptoms of bladder spasm.

- **Reduced output from the catheter** may indicate that the patient has a blocked catheter or reduced urine output related to their clinical condition. Observation of the patient for pain and abdominal distention; the drainage system for kinks and blockages should be undertaken. A bladder scan can be performed if the patient is thought to be in retention. If the catheter is blocked, a catheter change or bladder washout / irrigation may be indicated. Refer to TPCH nursing procedure for bladder irrigation below.

Catheter removal

All indwelling catheters should be removed as soon as they are no longer required. There is a direct correlation between Catheter Associated Urinary Tract Infection and the time the catheter is in situ’ and may also result in a longer length of stay in hospital (Stomski M. Urethral catheter removal - The Joanna Briggs Institute 2009).

When changing longer term catheters the amount removed from the balloon may be less than that inserted due to absorption of fluid across the balloon surface.
**ASSESSMENT**

Please source your answers and submit to your assessor or Nurse Educator. This assessment can be found in a format to complete and submit at the end of this package. You can also request for the assessment to be sent via email to complete electronically.

1. **Explain** the structures and function of the male lower urinary tract and reproductive system.
   a) Urinary Bladder
   b) Urethra (Identify the different anatomical parts)
   c) Penis including foreskin
   d) Prostate Gland
   e) Seminal Vesicles

2. **Explain** the structures and function of the female lower urinary tract and reproductive system.
   a. Urinary Bladder
   b. Urethra
   c. Labia and position of urethral meatus

3. **Discuss the difference** between Acute and Chronic retention of urine.

4. **List** five causes of Acute Urinary Retention.

5. **Explain** the following terms and how they may affect urethral catheterisation.
   **Males**
   a. Phimosis:
   b. Paraphimosis:
   c. Hypospadias:
   d. Urethral stricture:
   **Females**
   e. Urethral caruncle:
   f. Vaginal atrophy:

6. **Select the correct answer:**
   What solution should be used to clean the urethral meatus?
   a. Water for Irrigation
   b. Sterile normal saline
   c. Chlorhexidine Gluconate
   d. Iodine solution

7. **Identify** the size of 2 way catheter is routinely used for a male and female patient?
   **Male:**
   **Female:**
8. **Select the correct answer:**
   The catheter balloon should only be inflated when catheterising a male patient when?
   a. When urine is draining from the catheter
   b. When the catheter is advanced fully to the bifurcation
   c. When the patient is comfortable and not in pain
   d. No significant bleeding / trauma is noted
   e. All of the above

9. **Identify** which solution should be used to inflate the catheter balloon and how much?

10. **Explain** what would be the potential consequence of the following?
    Balloon under inflation:
    Balloon over inflation:

11. **Identify** what is the maximum time that the following catheters can be left in situ’?
    Intermittent (In-Out) ____
    Hydrogel coated latex __
    Silicone ______

12. **Discuss** the nursing care and principles of infection control when caring for a patient with a urethral catheter.
Conclusion

Long-term catheterisation is indicated for a wide range of conditions and in numerous circumstances but must always be a last choice intervention. Any healthcare professionals performing catheterisation in the community should have a solid understanding of the associated anatomy and physiology of the urinary system, and they should have either been initially assessed and/or be maintaining their competency to catheterise patients. In the community environment, it is essential that patients and their carers receive support and education on how to maintain their catheter and how they can reduce the risk of complications associated with indwelling catheters. Catheterisation can have a significant psychological effect on patients and anxiety can be reduced by the healthcare practitioner providing information and education. Catheter blockages and catheter-associated infections are the most common problems experienced by catheterised patients and it is essential that healthcare professionals know how to recognise, treat and manage these effectively in a proactive manner (RCN 2012) ensuring that their knowledge and skills are up to date.

Congratulations, you have now completed this self-directed learning package. Discuss any questions that may have been raised with your Clinical Educator or staff competent in the procedure.

Assessment of Competency

Please observe an indwelling urinary catheter being inserted on a male and a female patient (video or simulation if required).

Under the supervision of another nurse competent to perform urethral catheterization, use the attached competency assessment forms when performing the procedure. Undertake this skill until competent with a minimum of three (3) times successfully on a male and female patient.

References

Brian A. Selius, DO, Rajesh Subedi MD. (2010) Urinary Retention in Adults: Diagnosis and Initial Management. Northeastern Ohio Universities College of Medicine, St. Elizabeth Health Center, Youngstown, Ohio.


Australian Commission on Safety and Quality in Health Care, Page 201. Biotext Pty Ltd.


Urethral Catheterisation Competency Assessment

EQUIPMENT MALE & FEMALE

Dressing trolley
Disposable Foley Catheter of the appropriate size
- Females - Catheter size is generally 10-12FG - length 20-25 cm - balloon size 5-10mls
- Males - Catheter size is generally 14-16 FG unless otherwise ordered
Sterile catheter pack
Chlorhexidine irrigation solution 0.1% 30ml 1-2 ampoule (or 0.9% saline if not available)
2% lignocaine gel syringe – Lubricating gel to minimise urethral trauma
2 x 10ml syringes
Sterile water for balloon inflation
Appropriate sterile catheter drainage bag
Catheter securing tape
Plastic apron and protective eye wear
Sterile or non-sterile gloves (depending on ANTT risk assessment)
Sterile specimen container (if collecting specimen)
Bluey/plastic backed sheet or towel
General waste bag

Insertion of Indwelling Urinary Catheter

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Assessor</th>
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<tbody>
<tr>
<td></td>
<td>Ability</td>
</tr>
<tr>
<td>Obtain medical order.</td>
<td></td>
</tr>
<tr>
<td>Explain the procedure to the patient and obtain consent.</td>
<td></td>
</tr>
<tr>
<td>Perform hand hygiene.</td>
<td></td>
</tr>
<tr>
<td>Maintain patient privacy and dignity.</td>
<td></td>
</tr>
<tr>
<td>Position patient</td>
<td></td>
</tr>
<tr>
<td>Females - Position patient in supine position with hips and knees flexed and knees parted. Maintain patient’s privacy and dignity at all times.</td>
<td></td>
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<tr>
<td>Males - Position patient in supine position with knees slightly flexed and feet a little apart.</td>
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</tr>
<tr>
<td>Place a towel or bluey under the patient’s buttocks.</td>
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<tr>
<td>Remove the existing catheter if necessary. See removal section of this procedure.</td>
<td></td>
</tr>
<tr>
<td>Perform hand hygiene.</td>
<td></td>
</tr>
<tr>
<td>Don disposable apron, non-sterile gloves and eyewear.</td>
<td></td>
</tr>
<tr>
<td>Inflate balloon of catheter (connect 10ml syringe to catheter balloon port and gently withdraw balloon contents. When balloon empty, remove the syringe and gently pull out the catheter), inspect for encrustation and dispose of appropriately.</td>
<td></td>
</tr>
<tr>
<td>Perform hand hygiene.</td>
<td></td>
</tr>
<tr>
<td>Clean work surface and collect equipment.</td>
<td></td>
</tr>
</tbody>
</table>
### Assessment Criteria

<table>
<thead>
<tr>
<th>Action</th>
<th>Assessor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open sterile catheter pack and add equipment for the procedure to tray. Add sterile water to one galipot and chlorhexidine solution to the other.</td>
<td></td>
</tr>
<tr>
<td>Dispense lubricating gel onto sterile field.</td>
<td></td>
</tr>
<tr>
<td>Perform hand hygiene.</td>
<td></td>
</tr>
<tr>
<td>Don gloves (Sterile or Non-sterile, depending on ANTT Risk assessment)</td>
<td></td>
</tr>
<tr>
<td>If using Non-sterile gloves a NON TOUCH technique of key parts and key sites must be adhered to.</td>
<td></td>
</tr>
<tr>
<td>Check the catheter port for the volume of sterile water required to inflate the balloon.</td>
<td></td>
</tr>
<tr>
<td>Zip open proximal end of inner catheter packet, leaving the distal end of the catheter packet closed, and place in sterile kidney dish (Do not pre-test urinary catheter balloons as this is not routinely recommended).</td>
<td></td>
</tr>
<tr>
<td>Draw up the required amount of sterile water using sterile syringe contained in catheter pack.</td>
<td></td>
</tr>
<tr>
<td>Soak the sterile gauze in the chlorhexidine.</td>
<td></td>
</tr>
<tr>
<td>Cleanse area for insertion</td>
<td></td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
</tr>
<tr>
<td>Use the non-dominant hand, part the labia with two (2) gauze squares.</td>
<td></td>
</tr>
<tr>
<td>With the dominant hand, use the chlorhexidine soaked gauze (one wipe per gauze) to cleanse the labia majora and labia minora using single downward strokes, cleaning from front to back.</td>
<td></td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
</tr>
<tr>
<td>Use the non-dominant hand to hold the shaft of the penis and if necessary, retract the foreskin gently with the thumb and forefinger.</td>
<td></td>
</tr>
<tr>
<td>Using dominant hand and gauze, cleanse the penis from the urethral meatus to the base of the glans.</td>
<td></td>
</tr>
<tr>
<td>With 2% lignocaine gel, insert slowly into the urethral meatus using the dominant hand.</td>
<td></td>
</tr>
<tr>
<td>Place thumb over urethral meatus to allow the gel to remain inside urethra and allow 3-4 minutes for it to take effect.</td>
<td></td>
</tr>
<tr>
<td>Place penis on top of sterile towel.</td>
<td></td>
</tr>
<tr>
<td>Remove gloves and perform Hand Hygiene. Don new gloves.</td>
<td></td>
</tr>
<tr>
<td>Drape with sterile drape from catheter pack to groin area leaving labial area exposed. Do not touch the patient.</td>
<td></td>
</tr>
<tr>
<td>With dominant hand, lubricate the tip of the catheter with the lubricating gel.</td>
<td></td>
</tr>
<tr>
<td>Place sterile kidney dish containing catheter on the sterile drape between the patient’s legs.</td>
<td></td>
</tr>
<tr>
<td><strong>Insert catheter</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
</tr>
<tr>
<td>With the non-dominant hand, separate the labia and sight the urethral meatus.</td>
<td></td>
</tr>
<tr>
<td>Introduce the catheter tip gently into the urethral meatus and advance slowly until urine flows, approximately 5-6cms (if urine specimen required, collect this directly into the sterile container).</td>
<td></td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td></td>
</tr>
<tr>
<td>Place catheter in sterile kidney dish on the sterile drape in between the patient’s legs.</td>
<td></td>
</tr>
<tr>
<td>Hold the penis upright with the non-dominant hand and introduce the catheter tip gently into the urethral meatus using the sterile, dominant hand and advance slowly until urine flows, approximately 15-25cms (if urine specimen required collect this directly into the sterile container).</td>
<td></td>
</tr>
</tbody>
</table>
### Assessment Criteria

| Prior to inflating the balloon advance the catheter a further 2cms to ensure that it is not lodged in the bladder neck, prostate (males) or urethra and inflate the catheter balloon with the sterile water as per the manufacturer’s instructions – always ensure urine is flowing before inflating the balloon and stop if pain is felt. |
| If catheter is inserted into the vagina rather than the urethra leave the catheter in place as a guide and use a new catheter. |
| Gently withdraw the catheter until resistance is felt. |
| **Males** |
| If no urine appears or if resistance is felt on inserting the catheter, stop and wait a few minutes to allow any sphincter spasm to settle, before trying again. In order to minimise trauma to the prostate gland, do not use force to insert the catheter, especially in an elderly male. Consider asking the patient to take a deep breath; ask the patient to cough or bear down; ask the patient to try and pass urine or gently rotate the catheter. |
| If urine does not drain, lower the penis, ask the patient to deep breathe and cough, or reposition the catheter by gently rotating it. Refer to the medical officer for assistance if still unable to advance the catheter or obtain urine. |
| Lower the penis and if necessary, reposition the foreskin. |
| Attach the catheter to the urine drainage bag and secure catheter to the inner aspect of the thigh. Attach the urine drainage bag to the bed, a carrier, or the patient’s leg if wearing a leg bag. Ensure that all urine drainage bags used are sterile and connections secure. |
| Dispose of waste, clean trolley with Clinell wipes and perform hand hygiene. |
| Assist patient to reposition as necessary. |
| Documentation in the patient’s health records should include: |
| Patient education and consent; |
| Details of insertion; |
| Date, time of catheter insertion/change; |
| Condition of the removed catheter if applicable; |
| Catheter type, size, balloon size and volume of sterile water used to inflate the balloon; |
| Urine flow/description/colour, and urinalysis result if performed; |
| Due date for the re-insertion; |
| Due date for bag change; and |
| Detailed care plan for maintenance and care |
| (Loveday, et. al., 2014). |

| 1 = excess energy and not skilled to safe level |
| 2 = some excess energy, skilled satisfactory |
| 3 = proficient |

### Assessment Summary

| Comments: |
| Score: |

**COMPETENT**

Name of Assessed:  
Signed:  

Ward/Unit:  

Assessors Name:  
Date: ___/_____/______  
Signed:  
Date: ___/_____/______
### Insertion and Management of Indwelling Urethral Catheters: Urethral Catheterisation Clinical Skill

<table>
<thead>
<tr>
<th>Female - Patient One</th>
<th>Competent</th>
<th>Assessors Name: ____________________________</th>
<th>Assessors Signature: ____________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Position: ____________________________</td>
<td>Date Completed: ____________________________</td>
</tr>
<tr>
<td>Female - Patient Two</td>
<td>Competent</td>
<td>Assessors Name: ____________________________</td>
<td>Assessors Signature: ____________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Position: ____________________________</td>
<td>Date Completed: ____________________________</td>
</tr>
<tr>
<td>Female - Patient Three</td>
<td>Competent</td>
<td>Assessors Name: ____________________________</td>
<td>Assessors Signature: ____________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Position: ____________________________</td>
<td>Date Completed: ____________________________</td>
</tr>
<tr>
<td>Male - Patient One</td>
<td>Competent</td>
<td>Assessors Name: ____________________________</td>
<td>Assessors Signature: ____________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Position: ____________________________</td>
<td>Date Completed: ____________________________</td>
</tr>
<tr>
<td>Male - Patient Two</td>
<td>Competent</td>
<td>Assessors Name: ____________________________</td>
<td>Assessors Signature: ____________________________</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Position: ____________________________</td>
<td>Date Completed: ____________________________</td>
</tr>
<tr>
<td>Male - Patient Three</td>
<td>Competent</td>
<td>Assessors Name: ____________________________</td>
<td>Assessors Signature: ____________________________</td>
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<tr>
<td></td>
<td></td>
<td>Position: ____________________________</td>
<td>Date Completed: ____________________________</td>
</tr>
</tbody>
</table>
## Problem Solving / Trouble shooting

<table>
<thead>
<tr>
<th>Issue</th>
<th>Problem solving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritation by balloon</td>
<td>Potential allergy to latex. Care should be taken to use the correct amount of water to fill the balloon because too much or too little may cause distortion of the catheter tip. This may result in irritation and trauma to the bladder wall, consequently causing pain, spasm, bypassing and haematuria (NICE 2015). Complications can arise if the incorrect amount of water is used to inflate the balloon. If underinflated the drainage eyes of the catheter may become occluded or the catheter may become dislodged. If overinflated there is a risk of rupturing the balloon and that fragments of it will be left inside the bladder (Robinson 2004). The balloon should only be inflated once. Deflation/re-inflation or topping up is not recommended, as distortion of the balloon may occur (Robinson 2004, Nazarko 2010). It is important that catheter balloons are only filled with sterile water. Tap water and 0.9% sodium chloride should not be used as salt crystals and debris may block the inflation channel, causing difficulties with deflation, and tap water should not be used as any microorganisms which may be present could potentially pass through the balloon into the bladder (Dougherty and Lister 2015).</td>
</tr>
</tbody>
</table>

| Improper sizing of catheter / Wrong position | Urethral catheters are measured in charrières (ch). The charrière is the outer circumference of the catheter in millimetres and is three times the diameter. For example, a 12ch catheter has a diameter of 4mm. A catheter of 12ch is normally suitable for men and women (Nazarko 2010). The urethra is approximately 6mm in diameter, equivalent to a size 16ch catheter (Dougherty and Lister 2015). Catheter size will have an effect on patient comfort so it is an essential consideration when assessing the patient. The bigger the catheter the more the urethral is dilated. Potential side-effects of larger gauge catheters include: » Pain and discomfort. » Pressure ulcers, which may lead to stricture formation. » Blockage of paraurethral ducts. » Abscess formation (Winn 1998). » Bypassing – urethral leakage. (NICE 2015) Therefore, it is important to always choose the smallest catheter that is capable of maintaining adequate draining (Robinson 2006). |
| Confusion | Perform urinalysis Discuss with Medical team (MSU) |
| Bacteraemia | Febrile, urinalysis contains nitrites Patient feels unwell and discomfort Assess for deteriorating patient Discuss with Medical team |
| Constipation or faecal impaction | Provide education around health, diet and exercise as constipation will also have an impact on the catheter. A healthy diet including plenty of fibre is important, as is regular exercise (RCN 2012). If constipation is due to bladder spasms, then antimuscarinic medication |
self-directed learning package

Insertion and management of indwelling urethral catheters

Printed versions are uncontrolled

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should be considered. Antimuscarinic medication blocks the muscarinic receptors at the detrusor muscle and calms the spasm (Davey, 2015).

### Blocked catheters
Catheters can become blocked by encrustations or calcium deposits, which can result in bypassing or retention.

Blockage can occur in 40-50% of patients (Geng et al 2012) and one of the most common causes is the lumen becoming blocked by encrustation or debris (RCN 2012).

Encrustations are formed by urease-producing bacteria which, when colonised, result in the urine becoming alkaline, causing crystallisation. These crystals then adhere to the balloon and drainage holes of the catheter (Choong et al 2001).

Blockage can also be caused by bladder spasm or by constipation, where the full bowel exerts pressure on the urethra.

Catheter diaries – records of catheter change and indications why – can help to identify a characteristic pattern. The identified pattern can then be used to plan recatheterisation before blockage.

When a catheter has been in place for more than 28 days the probability of urinary infection increases (Prinjha and Chapple 2013).

Increase fluid intake – this will help to dilute the urine and potentially reduce the risk of encrustation and blockages.

### Signs of Blockage include:
- Reduced or no urine output
- Haematuria
- Urine bypassing the catheter
- Lower abdominal pain

Do not attempt to unblock a catheter unless competent to do so.

### Required Equipment
PPE, sheet protector, sterile 50ml syringe with catheter tip, sterile jug or kidney dish, additional jug or kidney dish, 1 Litre Sodium Chloride 0.9%, new drainage system

### Procedure:
- Place a clean jug/kidney dish within easy reach. Place sheet protector under patient’s buttocks
- Perform Hand Hygiene and do gloves, apron and protective eyewear.
- Draw up the Sodium Chloride 0.9% into 50ml catheter tip syringe
- Disconnect and discard the drainage system
- Wipe the catheter end with an alcohol swab
- Attach syringe and gently push the fluid into the bladder and then draw back immediately
- Empty contents of syringe into jug or kidney dish
- Draw up clean fluid and repeat steps until fluid is returned freely
- Ensure that the volume instilled into the bladder via the syringe is equal to the volume that drained from the bladder during this process.
- Connect the new drainage system.
- Remove gloves and apron and perform Hand Hygiene.
- Ensure the patient is comfortable. Document the procedure and results in the medical record.

### Faulty catheters
Leakage: remove and replace catheter
Observe for signs of infection

### Leakage
This may be caused by a blocked catheter or bladder spasm. The sensitive trigone area of the bladder may be stimulated by the balloon. Larger catheters and balloon sizes may exacerbate this problem.

A smaller catheter may overcome this problem. Ensure that no more than 10mL of water is used in the balloon.

Document fluid type and intake as certain drinks, such as caffeine, can irritate the bladder and cause spasm (Geng et al 2012).


ASSESSMENT

Please source your answers and submit to your assessor or Nurse Educator. You can also request for the assessment to be sent via email to complete electronically.

1. **Explain** the structures and function of the male lower urinary tract and reproductive system.
   a) Urinary Bladder

   b) Urethra (Identify the different anatomical parts)

   c) Penis including foreskin

   d) Prostate Gland

   e) Seminal Vesicles

2. **Explain** the structures and function of the female lower urinary tract and reproductive system.
   a) Urinary Bladder

   b) Urethra

   c) Labia and position of urethral meatus
3. **Discuss the difference** between Acute and Chronic retention of urine.

4. **List** five causes of Acute Urinary Retention.

5. **Explain** the following terms and how they may affect urethral catheterisation.

   **Males**
   - Phimosis: ___________________________________________________________
   - Paraphimosis: ______________________________________________________
   - Hypospadias: _______________________________________________________
   - Urethral stricture: __________________________________________________

   **Females**
   - Urethral caruncle: __________________________________________________
   - Vaginal atrophy: ____________________________________________________

6. **Select the correct answer:**

   What solution should be used to clean the urethral meatus?
   - a) Water for Irrigation
   - b) Sterile normal saline
   - c) Chlorhexidine Gluconate
   - d) Iodine solution

7. **Identify** the size of 2 way catheter is routinely used for a male and female patient?

   **Male:** ____________________________________________________________
   **Female:** __________________________________________________________

8. **Select the correct answer:**

   a) The catheter balloon should only be inflated when catheterising a male patient when?
   b) When urine is draining from the catheter
   c) When the catheter is advanced fully to the bifurcation
   d) When the patient is comfortable and not in pain
   e) No significant bleeding / trauma is noted
   f) All of the above
9. **Identify** which solution should be used to inflate the catheter balloon and how much?

10. **Explain** what would be the potential consequence of the following?
   
   Balloon under inflation:
   
   Balloon over inflation:

11. **Identify** what is the maximum time that the following catheters can be left in situ?
   
   Intermittent (In-Out) _____
   Hydrogel coated latex _____
   Silicone _____

12. **Discuss** the nursing care and principles of infection control when caring for a patient with a urethral catheter

   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
<table>
<thead>
<tr>
<th>Complication</th>
<th>Cause</th>
<th>Action</th>
</tr>
</thead>
</table>
| Urinary tract infections | Bacteria entering the bladder via the catheter or alongside the catheter. | Reduce risks by:  
- Appropriate catheter use.  
- Ensuring that an aseptic technique is used during insertion.  
- Maintaining a closed drainage system.  
- Changing the drainage system according to manufacturer's recommendations.  
- Securing the drainage system correctly.  
- Promoting excellent hygiene.  
- Encouraging a good fluid intake.  
- Prompt removal of catheter.  
- If CAUTI is suspected, manage and treat immediate symptoms and obtain a catheter specimen of urine. |
| Inadequate drainage of urine | Catheter incorrectly placed | Reinsert the catheter and check that the drainage holes (eyes) are properly located in the bladder (RCN 2012). |
| | Draining tubing kinked | Inspect the catheter drainage tubing, working away from the body, looking for any bends or kinks. |
| | Blocked drainage tubing. | Gently milk the tubing to dislodge the debris.  
- The position of the catheter bag will also affect the drainage. The bag should be below the level of the bladder to allow gravity to assist with the drainage (Pinnock and Chapple 2013). |
| Catheter blockage | Catheters can become blocked by encrustations or calcium deposits, which can result in bypassing or retention. Blockage can occur in 40–80% of patients (Gong et al 2012) and is one of the most common causes of the lumen becoming blocked by encrustation or debris (RCN 2012). Encrustations are formed by urine-producing bacteria which, when colonised, result in the urine becoming alkaline, causing crystallisation. These crystals then adhere to the balloon and drainage holes of the catheter (Cheong et al 2001). Blockage can also be caused by bladder spasm or by constipation, where the full bowel exerts pressure on the urethra. | The cause of blockage must be distinguished initially to develop appropriate care plans. In the event of a blocked catheter re-catheterisation will also help the nurse to identify the cause.  
- Encrustations are sometimes identified by observation of the tip of the catheter on removal.  
- Catheter diaries – records of catheter change and indications why – can help to identify a characteristic pattern. The identified pattern can then be used to plan re-catheterisation before blockage. When a catheter has been in place for more than 28 days the probability of urinary infection increases (Pinnock and Chapple 2013).  
- Increased fluid intake – this will help to dilute the urine and potentially reduce the risk of encrustation and blockages. (RCN 2012) |
| Leakage of urine around catheter – bypassing | This may be caused by a blocked catheter or bladder spasm. The sensitive trigone area of the bladder may be stimulated by the balloon. Larger catheters and balloon sizes may exacerbate this problem. | A smaller catheter may overcome this problem. Ensure that no more than 10mL of water is used in the balloon.  
- Document fluid type and intake as certain drinks, such as caffeine, can irritate the bladder and cause spasm (Gong et al 2012). Provide education around health diet and exercise as constipation will also have an impact on the catheter. A healthy diet including plenty of fibre is important, as is regular exercise (RCN 2012).  
- If constipation is due to bladder spasms, then antimuscarinic medication should be considered. Antimuscarinic medication blocks the muscarinic receptors at the detrusor muscle and calms the spasm (Davies 2015). |
| Pain | Patients may experience abdominal pain when a catheter is first inserted. If insufficient water is introduced into the balloon the catheter may become dislodged, causing pain. Muscle contractions may also cause pain. | Anticholinergic medication may help with muscle contractions.  
- Ensure balloon is inflated with correct amount of water when catheterising. |
| | Urethral discomfort can be caused by using a catheter which is too large. This can also lead to infection, urethritis and an offensive discharge around the catheter. | Ensure the appropriate type, size and length of catheter is selected. |
| Trauma | Long-term catheterisation can lead to urethral trauma, especially in men. This is due to the length and curvature of the male urethra and the need to pass the catheter through the prostate gland. Catheters need to be changed at least every three months and this process can lead to inflammation of or tearing of the urethral mucosa. | Trauma can be minimised by appropriate selection of catheter material and size.  
- Ensure the catheter and draining system is secured properly to minimise the risk of trauma.  
- Frequent emptying of the catheter bag to prevent it becoming too heavy |
| Haematuria | | Small amounts of blood are commonly found in the urine of catheterised patients, often from trauma or infection. If there is severe bleeding they should seek medical attention immediately. |
| Purple bag syndrome | The bacterial decomposition of tryptophan, an essential amino acid, can make the bag turn a purple colour | More likely to be seen in older patients who are immobile. Harmless and no action required. |