Module 27
URINARY PROBLEMS

OBJECTIVES

Upon completion of this module, you will be able to

- Define selected anatomical terms related to the urinary system.
- Identify two common problems requiring urinary elimination interventions.
- Discuss the appropriate catheter selection in terms of size and type.
- Name four routes used in urinary elimination by catherterization.
- Using the nursing process, describe how to perform selected urinary elimination techniques safely.
- Discuss goals of care and the principles and guidelines the nurse must know in order to care for the patients with urinary indwelling catheters.

Unit 1
The Urinary System

COMMENTS:

The urinary system plays a major role in maintaining homeostasis in the body. The principal function of the lower urinary tract; the ureters, bladder, and urethra is the transportation of urine from the kidneys, thereby removing waste products from the body. It is one of four routes the body uses to eliminate waste.

The urinary system: anatomical terms

The kidneys are located in the **retroperitoneal space** on either side of the vertebral column, between the twelfth thoracic and third lumbar space. Urine is formed by the processes of filtration, reabsorption, and secretion. Once formed, it is carried from the kidney into the renal pelvis and then to the bladder via the **ureters** by peristaltic waves.

The urinary **bladder** is a hollow, muscular organ which lies behind the symphysis pubis. In the female it lies in front of the uterus and vagina; in the male it lies in front of the rectum and above the prostate gland. The bladder stores urine and as it fills, the muscle fibers expand and the stretch receptors in the bladder wall are stimulated. The first urge to void is usually at about 150 ml and a marked feeling of fullness usually occurs at 400 ml.

The **trigone** is the base of the bladder, with the ureter openings in the posterior corners and the urethra opening into the base of the triangle.

The urethra extends from the bladder to the outside of the body terminating in the **urethral meatus**. The length of the urethra varies, being longer in the male (8 inches) than in the female (1.5 inches). (See Figure 1.)

Two sphincter muscles, one voluntary and the other involuntary, as well as abdominal and perineal muscles are involved in the act of releasing urine or **micturition**. Urine retained in the bladder after voiding is called **residual urine**. Normally all but approximately 1-3 ml is excreted from the bladder following micturition.

Figure 1
The Anatomical Structures of the Urinary Tract

Unit 2
Common Urinary Problems
Requiring Nursing Intervention

COMMENTS:

An alteration in the normal elimination pattern occurs whenever physiological or psychosocial factors obstruct the flow or interfere with the neuromuscular ability to move and expel urine. Two altered elimination patterns which may require a nursing intervention, such as catheterization, are discussed below.

Alteration in elimination patterns: retention

Urinary retention means that the urine is produced by the kidneys, but it accumulates in the bladder and is not released. Obstruction at or below the bladder outlet is the most common cause of retention. An example is prostatic hypertrophy (enlargement of the prostate gland), which is common in males past age 50.

Three problems arise from retention: urinary stasis leading to infection, stone formation, and loss of bladder control. It is important to distinguish retention from oliguria and anuria, which indicate abnormal kidney function. **Oliguria** means the kidneys are producing a scant amount of urine; **anuria** means the kidneys are not producing urine at all.

The prime manifestation of urine retention is bladder distention. Some adult bladders may distend to hold 3000-4000 ml in urinary retention. As the bladder fills with retained urine, it rises above the level of the symphysis pubis. On percussion over the bladder the sound produced is a “kettle drum” sound. The patient may also experience discomfort, an urgent need to urinate, as well as restlessness and diaphoresis.

If the patient voids more than once per hour in amounts of 25-50 ml at a time, the problem may be **retention with overflow**. This results from rising pressure which overcomes the restraint of the sphincter, causing some urine to flow out. When the pressure is reduced, the external sphincter again gains control of the urine flow. The patient usually feels as though his or her bladder never really empties.

Alteration in elimination patterns: incontinence

Incontinence is the temporary or permanent inability of the urinary sphincter to control the elimination process. There are three types:

1. active incontinence with complete emptying of the bladder
2. active incontinence with leaking or incomplete emptying
3. passive incontinence with constant leaking

Incontinence is caused by interference with sphincter control due to psychosocial, anatomical, neurogenic, or pharmacological factors. It is seen commonly in the elderly as part of the aging process, and also in patients with enlarged prostate glands, spinal cord injuries, recurrent urinary tract infections, bladder spasms, loss of consciousness, or dependency on drugs such as narcotics and analgesics.

Other clinical situation requiring catheterization

Urinary catheterization may also be indicated for bladder decompression preoperatively or postoperatively, instillation of medication into the bladder, accurate measurement of intake and output in critically ill patients, or measuring residual urine following voiding.

Two reasons which are not indications for urinary catheterization are:

- routine gathering of a sterile specimen for the lab
- convenience of the caregivers.

Catheters should be the final means of providing a dry environment for the patient in order to prevent skin breakdown and protect dressing or skin lesions.

Unit 3
Nursing Diagnoses Associated with
Urinary Elimination Interventions

COMMENTS:

In recent years, the value of catherization has been increasingly suspect in view of the risks involved. Two of the more common problems are alteration in immunological status: potential for infection and alteration in integumentary status: potential for tissue trauma.

Potential for infection

The urinary tract is the most common site for nosocomial infections. Over 80 percent of those who develop nosocomial urinary tract infections have undergone some kind of urologic instrumentation. It is well-documented that bacteria in the urine increases in direct relationship with the length of time the catheter is in place.

The most common organisms are escherichia coli, klebsiella, pseudomonas aeruginosa, streptococcus, and staphylococcus.

Some basic principles should be kept in mind in relation to lower urinary tract infections:

- The bladder is normally a sterile cavity
- The meatus or external opening can never be sterilized.
- The bladder has defense mechanisms. It empties itself regularly and it maintains an acidic environment which has antibacterial advantages. These two factors normally help to maintain a sterile bladder and/or clear an infection if it occurs.
- Pathogens may enter the urinary drainage system when it is opened for any reasons, and they may intrude via the thin layer of fluid and exudate which forms around the outside of the catheter.
- Pathogens introduced readily ascend because the urinary tract has a continuous mucous membrane lining from the urinary meatus to the kidneys. Bladder infections in themselves can be serious; even more serious may be kidney infections.
- A normal bladder is not as susceptible to insult as an injured one. A patient's compromised state, due to disease or stress, predisposes him/her to urinary tract infections.
- Women are more susceptible to urinary tract infections than men. The shorter female urethra reduces the distance between the bladder and the outside. The

anatomical location of the meatus also makes it vulnerable to fecal and vaginal contamination.

Potential for tissue trauma

Tissue trauma can also occur during urologic instrumentation procedures. The membrane lining is delicate and easily damaged by friction as the catheter is inserted. The male urethra is longer and more tortuous, so it is particularly vulnerable to injury during the insertion process. Damage to the urethra can occur in either male or female if the catheter is forced through a stricture or at an incorrect angle. Tissue irritation or necrosis can result from an oversized catheter and also from continuous pressure or constant in-and-out motions against the urethra.

Alteration in psychological status

A person's psychological status may cause dysfunctions in the urinary system. People are emotionally affected by the performance of the urinary system and, at the same time, the urinary system is influenced by various psychosocial factors. Some of these include the following:

- **Past experiences** may produce negative or positive effects as to how the patient views her/his present situation.
- **Embarrassment** due to exposure of body parts and functions may greatly distress the patient.
- **Anxiety and fear of the unknown** may intensify urinary disorders and complicate urinary elimination interventions.
- **Changes in body image and self-esteem** can result from short-and long-term use of urinary elimination equipment.
- **Conflicts** between **dependence and independence** may develop between the patient and her/his caregivers or family.
- The **fear of impending or eventual death** may be a real concern because most people recognize that a functioning renal system is essential to life.

Units 1, 2, and 3
Self-Test

MATCHING: Match the term in Column 1 with the description or phrase in Column 2.

_____ 1.	retroperitoneal space	a.	normally 1-3 milliliters
_____ 2.	incontinence	b.	urine accumulated in bladder
_____ 3.	anuria	c.	location of kidneys
_____ 4.	female urethra	d.	urine not present in bladder
_____ 5.	retention	e.	from kidneys to bladder
_____ 6.	ureter	f.	eight inches long
_____ 7.	residual urine	g.	small amounts of urine
_____ 8.	oliguria	h.	at base of bladder
_____ 9.	male urethra	i.	from bladder to meatus
_____ 10.	trigone	j.	1 ½ inches long
_____ 11.	urethra	k.	problem with storage and/or control

TRUE/FALSE

_____ 12. The urinary meatus should be sterilized prior to urinary elimination techniques.

_____ 13. The urine is normally acidic.

_____ 14. The urinary system is not greatly affected by emotional and psychosocial factors.

_____ 15. A good reason to insert a catheter is to facilitate caregiving to the patient

_____ 16. Incontinence can be caused by psychosocial, anatomic, or pharmacologic factors.

Unit 4
Catheter Selection

COMMENTS:

Catheters are commonly made of rubber or plastic and are categorized into two types: straight (Robinson) and retention (Foley). (See Figure 2.)

A **Robinson catheter** is a single-lumen tube with a small opening half an inch from the insertion end. When a straight catheter is inserted, the bladder is drained of urine and the catheter is immediately removed.

A **Foley catheter** is inserted and remains in place, connected to a closed drainage system. The Foley may have a double or triple lumen. One lumen is connected to an inflatable balloon designed to hold the catheter in place in the bladder. A third lumen is used for irrigating purposes.

Figure 2
Robinson and Foley Catheters

Catheters come in various tip shapes and sizes. An example of a different tip shape is the Coude, which is a straight catheter with a curved tip. It is easier to control because it is somewhat stiffer.

Catheters are sized by the diameter of the lumen using a French scale of even numbers. The larger the number, the larger the lumen. In women, urethral catheter sizes 14 to 16 Fr. are most common. In men sizes 16 to 18 Fr. are usually used.

A catheter size that is too small may result in obstruction of the urinary flow by clots, mucous, plugs, or sediment. If the catheter is too large, tissue erosion may occur due to excessive pressure on the urethra. It can also cause bladder spasms and urine leakage. If left in place for a long time, an overly large catheter may dilate the urethra.

When selecting the catheter size, consider the patient's needs and the purpose of the catheterization, then choose the smallest size capable of doing the job.

Unit 5
Catheterization Routes

COMMENTS:

Four routes may be used for urinary elimination by catheterization: suprapubic, nephrostomy tube, ureteral, and urethral.

Suprapubic

The suprapubic is the simplest and oldest method of urinary diversion. The catheter is inserted by the physician directly into the bladder through an incision or trochar puncture. The catheter is usually secured in place with sutures and/or a body seal, and is connected to a closed drainage system. When the catheter is removed, the bladder muscle layers contract over the site of insertion and seal off the opening.

Advantages of this route are

- reduced incidence of urinary tract infections
- ease in evaluating the patient's ability to void normally, ie. the patient can attempt voiding with catheter clamped.
- increased comfort and convenience for the patient.

However, some complications include

- poor drainage due to mechanical obstruction by the bladder wall, sediment, or a clot.
- dislodgement of the catheter.
- hematuria, especially after use of large bore catheter.

Nursing measures to insure patency include coiling the excess tubing on the bed. Having the patient turn from side to side, milking the tubing, and if other measures fail, irrigation.

Nephrostomy tubes

Nephrostomy tubes may be inserted into the pelvis of the kidney if there is complete obstruction of the ureters. It is important to remember that the tubes should **never** be kinked, clamped, or irrigated. The pelvis of the kidney holds only 5 ml and damage may result if the volume of urine in the pelvis causes too great a pressure.

Infection and the formation of stones are complications associated with nephrostomy tubes.

Ureteral catheters

Ureteral catheters are tiny, semi-ridged catheters which are inserted into the ureter with the tip frequently in the renal pelvis. The distal end of the catheter extends through the bladder and out the urethra or through an abdominal incision. As with nephrostomy tubes, ureteral catheters should **never** be clamped or kinked. These catheters are easily plugged with chemical sediment, mucous shreds, and blood clots. Ureteral peristalsis will occasionally push the catheters out of the ureter into the bladder.

The nurse should know that it is normal for some urine to drain around the ureters into the bladder, so accurate measurement of drainage from both ureteral and urethral catheters is necessary.

Urethral catheters

The most common route of urinary catheterization is, of course, through the external meatus, into the **urethra**, beyond the internal sphincter into the bladder.

In the next unit, three urinary elimination techniques will be outlined, followed by some general principles and goals of nursing care of the indwelling catheter.

Units 4 and 5
Self-Test

COMPLETION

1. A Robinson Catheter is a _____ type.

2. The third lumen in a Foley catheter is for _____ purposes.

3. The usual size of a urethral catheter is

   a. _____ for women, and

   b. _____ for men.

4. Name three problems that may result from a catheter that is too large.

   a. _____

   b. _____

   c._____

5. Name one possible result of a catheter size that is too small.

   _____

MATCHING: Match each of the phrases in Column 2 to one of the catheterization routes in Column 1.

Column 1	Column 2
_____ 6. suprapubic	a. nursing care may involve emptying two catheters
_____ 7. ureteral	b. may be more convenient for patient
_____ 8. nephrostomy tube	c. inserted into kidney pelvis
_____ 9. urethral	d. most common route
	e. usually inserted by a physician
	f. usually inserted by a nurse
	g. indicated in complete obstruction of ureters
	h. peristalsis can push into bladder
	i. oldest method
	j. reduced incidence of urinary infections

Unit 6
Procedures for an Indwelling
Urethral Catheter

COMMENTS:

Inserting the catheter

Assessment. In preparation for this procedure, the nurse should:

1. determine when the patient voided last and note the amount.

2. assess for urinary retention by observing for a distended bladder. Palpate or percuss the bladder just above the symphysis pubis.

Assessment technique: To **palpate** the bladder, indent the skin at least ½ inch by pressing the fingers of one hand over the fingers of the other hand. This increases the pressure for percussion.

To **percuss** the bladder, place the middle finger of oen hand against the skin and strike it sharply with the middle finger of the other hand. If the bladder is full, you will hear a dull or "kettle drum" sound.

3. assess for signs of urinary infection

4. assess the patient's ability to lie quietly and maintain the position during the procedure so sterility will not be interrupted.

5. obtain the physician's order and the patient's record for such information as the amount of urine to be (initially) removed, the type and size of the catheter, and previous surgery.

Planning. The nurse should gather the following equipment and supplies:

1. a sterile retention catheter set which includes

sterile gloves	sterile drapes
antiseptic solution	cotton balls
water-soluble lubricant	forceps
a Foley catheter of	drainage bag and
desired size	tubing
receptacle for urine	pre-filled syringe
	to inflate balloon

2. non-allergic tape, safety pin, bath blanket.

3. soap, basin of water, wash cloth, and towel.

Intervention. Before beginning the procedure, explain to the patient the reason for inserting the catheter, how long it will be in place, and how the equipment needs to be handled to facilitate drainage. Also explain that he/she should not experience pain with the procedure, only a pressure sensation and an initial urge to void, both of which will disappear. Be sure to provide privacy for the procedure. Follow these steps:

1. Wash hands

2. Position or assist the patient to the required position:

   Female: supine position with the knees flexed and thighs externally rotated.

   Male: supine position with knees slightly flexed and thighs slightly apart to relax abdominal and perineal muscles.

3. Drape the patient accordingly with blankets to minimize exposure.

4. Wash the perineal area with warm water and soap; dry thoroughly.

Rationale: Cleanliness reduces the possibility of introducing microorganisms with the catheter.

5. Adjust the light for adequate vision of meatus.

6. Open the sterile catheter set and put on the sterile gloves. Place the sterile set between the patient's legs.

7. Drape the patient with the sterile drapes, placing the first one under the buttocks as an underpad; the second, if fenestrated, over the perineal area.

8. Test the balloon of the catheter by attaching the syringe and injecting the fluid. The balloon should inflate appropriately and should not leak. Withdraw fluid and set aside for future use.

9. Pour antiseptic solution over cotton balls or prepare antiseptic swab.

10. Lubricate the tip of the catheter liberally.

    Rationale: Water-soluble lubricant reduces friction and facilitates insertion of catheter. It is important to lubricate at this point because the nurse will later have only one sterile hand.

11. Cleanse the meatus using the forceps and antiseptic swabs.

    Female: Separate the labia majora with the thumb and index finger of one hand. With the forceps in the other hand, cleanse the labia minora with downward strokes on each side and discard after each stroke. Do not let the labia close over the meatus once it is located and cleansed.

    Male: Grasp the penis behind the glans and cleanse the meatus in a circular fashion. Discard swab after each swipe.

    Note: At this point the hand touching the patient's skin for cleansing is no longer sterile.

12. Place the drainage end of the catheter in the sterile receptacle.

13. Pick up the insertion end of the catheter with the sterile gloved hand and hold it approximately 2-3 inches from the tip. Variation for **male** catheterization: Pick up the insertion end of the catheter with sterile glove, holding it 3-4 inches from the end. The first 2-3 inches should have been previously lubricated.

14. Insert gently into the urinary meatus about two inches or until urine flows. Insert in the direction of the urethra; if resistance is met, do not use force. Ask the patient to take deep breaths.

Rationale: Deep breathing may help to relax the external sphincter. When the urine flows, use the hand that was holding the labia to hold the catheter in place at the meatus.

Variation for **male** catheterization: To insert the catheter, hold the penis in a perpendicular position (90°) to the body and exert slight traction upward. Insert the catheter eight inches or until urine begins to flow. Slight resistance at the sphincter may be overcome by twisting the catheter and/or by asking the patient to take deep breaths or to try to void. When the urine flows, lower the penis and transfer your hand to the catheter about two inches from the urethra to hold it in place.

15. Insert the catheter an additional one to two inches beyond the point at which the urine began to flow.

16. Inflate the balloon by injecting the contents of the pre-filled syringe into the valve of the catheter. Insert no more than the balloon size indicates.

17. When the balloon is safely inflated, apply slight tension on the catheter until resistance is felt, and then move the catheter slightly back into the bladder.

18. Remove the protective cap from the tubing of the drainage system and attach it to the catheter. **Always** handle both ends **at least one inch** away from both tips. Be sure the emptying base of the drainage bag is closed.

19. Anchor the catheter to the inside of the patient's thigh with nonallergenic tape.

Rationale: Taping restricts the movement of the catheter, reducing the friction and irritation in the urethra as the patient moves.

20. Coil the drainage tubing beside the patient and fasten it to the bed with a pin or a clamp.

21. Dry the patient's perineum with a towel or drape.

22. Reposition for comfort. Assess the patient's reaction and expected outcomes.

23. Wash hands.

24. Record the procedure.

Evaluation. The nurse should expect the following outcomes:

- urine of normal color, odor, and consistency.
- decreased bladder distention.
- patent drainage system.
- no redness or skin breakdown around meatus.
- patient relaxed and comfortable with urinary elimination device in place and knowledgeable about its function and care.

Removing a retention catheter

A few days prior to the removal of the retention catheter, the catheter may be clamped for short periods of time and then released. This causes some bladder distention and stimulation of bladder musculature.

Assessment. Prior to the procedure, the nurse should assess the color, consistency, and amount of urine in the bag, obtain the medical or nursing order, and determine the size of the Foley catheter balloon.

Planning/Preparation. The nurse should gather the following equipment:

- a receptacle for the catheter after it is removed.
- a syringe to deflate the balloon, with or without needle.
- cotton balls or towel to dry perineal area.
- disposible exam gloves to protect the nurse.

The nurse should wash his/her hands and put on exam gloves.

Intervention. The nurse should follow these steps:

1. Explain the procedure to the patient.

2. Clamp the catheter to prevent spilling urine.

3. Insert the syringe into the appropriate portion of the catheter and draw out the fluid, completely deflating the balloon.

4. Gently remove the catheter from the urethra and dispose in a receptacle. (Hint: Have the patient inhale deeply; as he/she exhales, remove the catheter.)

5. Dry the perineal area.

6. Measure the urine in the drainage bag.

7. Record.

8. Encourage the patient to drink a large volume of fluids if not contraindicated.

Rationale: Urethral irritation from the catheter may cause some burning upon voiding. Diluting the urine with a good fluid intake will minimize the problem.

Evaluation. The nurse should expect, as an outcome, that the patient is able to void adequate amounts at normal intervals and that the patient's urine is clear.

Irrigating a catheter

The third procedure to be outlined is irrigation of a retention catheter. It involves introducing a solution into the bladder for the purpose of clearing an obstruction, then immediately removing the catheter. If the solution, for example an antiseptic solution, is placed in the bladder and allowed to remain there for a period of time, it is called a **bladder instillation.**
There are two types of drainage systems used with a Foley catheter. The more traditional type is the **open system** in which the tubing is separated from the catheter to perform such techniques as an irrigation. The **closed system** is being used increasingly because of the danger of pathogens entering the urinary tract whenever the system is opened.

A syringe may be used to irrigate both types of drainage systems; the techniques for both these system will be discussed below. Other methods for irrigation are using a Y-connector for an **intermittent irrigation**, or a three-way Foley for a **continuous irrigation**. Diagrams will be used to illustrate these two types.

Using a syringe to irrigate a catheter

Assessment. Prior to the procedure, the nurse should:

1. Assess whether indeed the catheter is blocked. To "milk" the catheter, work the fingers along the catheter and tubing away from the patient toward the drainage bag.

   Rationale: This may dislodge a clot or obstruction, avoiding an unnecessary irrigation.

2. Assess the patient for distress, such as pain, tenderness, and discomfort due to spasms.

3. Assess the color and clarity of the urine and compare the amount in the bag with the previous shift's output.

4. Check the physician's order and/or the agency policy as to amount, strength, and temperature of solution.

Planning/Preparation: The nurse should gather the following equipment for a closed drainage system:

- A sterile irrigation set which includes a sterile container for the solution, disinfectant-saturated cotton balls or swabs, a drape, and a syringe (a 30-50 ml with a #18 or #19 needle).
- Sterile irrigating solution that is at least room temperature. Sometimes solution that is warmed to body temperature is more comfortable to the patient.
- A tubing clamp.
- A bath blanket
- Disposable exam gloves.

Additional equipment needed for an **open** drainage system:

- Sterile drainage tube protector.
- Sterile asepto or catheter syringe
  (See Figure 3).
- Sterile drainage receptacle.

A. Asepto Syringe B. Catheter Syringe

FIGURE 3

Intervention. The nurse should follow these steps:

1. Explain the procedure to the patient and answer any questions he/she may have.
2. Wash hands and put on gloves.
3. Provide privacy for the patient.
4. Assist the patient to a dorsal recumbent position.

Rationale: This facilitates the flow of the fluid into the bladder.

5. Fold back linen and drape with a bath blanket to prevent undue exposure.

6. Open the sterile set beside the patient between his/her thighs.

For a closed drainage system:

7. Place the sterile drape under the end of the catheter.

8. Draw the irrigating solution into the syringe, keeping the syringe and the solution sterile.

9. Attach the needle to the syringe.

10. Using the disinfectant swab, cleanse the port on the drainage tubing, or the designated area on the catheter lumen.

11. Insert the needle into the port and infuse the solution gently into the catheter, using 30-40 ml of solution for an adult.

12. Remove the needle from the port and lower the catheter so that fluid runs out of the catheter into the drainage tubing.

13. Repeat steps as necessary until the ordered amount of solution is gone or the catheter is cleared and runs freely.

14. Empty the bag and note the amount of urine on the bedside intake and output record by subtracting the irrigation volume from the total urine volume in the bag.

15. Assess the response of the patient, any discomfort experienced, and the color, clarity and any abnormal constituents in the urine.

For an open drainage system:

7. Disinfect the end of the catheter and the end of the drainage tubing and separate the tubings. Place the protector over the end of the drainage tubing. **Always** hold the tubings **at least one inch** away from the ends.

8. Draw up solution into the asepto or catheter syringe and gently inject it into the catheter.

9. Remove the syringe and allow the irrigant to return into the drainage receptacle.

10. Repeat until the solution is used or catheter is flowing freely.

11. Empty the drainage receptacle and measure the amount to compare with the amount of irrigating fluid used.

12. Assess the patient's response as in #15 above.

13. Reposition the patient comfortably and wash your hands.

Intermittent or continuous bladder irrigation

Intermittent bladder irrigation may be accomplished by the equipment setup illustrated in Figure 4.

One lumen of a three-way Foley catheter is connected to the irrigating solution container. Note that the tubing includes both a drip chamber and a tubing clamp.

The second lumen is attached to drainage bag by a tubing which also contains a clamp.

Figure 4
Intermittent Bladder Irrigation Equipment

The clamp from the solution container is released while the clamp to the drainage bag remains closed. The fluid enters the bladder and remains in the bladder. Unless otherwise ordered by the physician, the amount instilled is usually about 100 ml for an adult. The solution container clamp is then closed, and the clamp to the drainage bag is opened, allowing the irrigant to flow out of the bladder. This can be carried out on a regular basis.

The same setup can be used for a **continuous** irrigation. The irrigation fluid is carefully adjusted to flow at a rate ordered by the physician, usually at a rate of 40-60 ml per hour. The nurse should regularly inspect the fluid returns for amount, color, and clarity. The amount of fluid returning should correspond to the amount of fluid entering the bladder.

Figure 5 illustrates how intermittent irrigation can be accomplished in a similar fashion using a Y-connector.

Figure 5
Intermittent Irrigation Using a Y-Connector

Unit 7
Goals and Principles of Nursing Care

COMMENTS:

Nursing care planning for patients with indwelling urinary catheters should include:

- maintaining patency of the catheters.
- providing for the patient's safety and comfort.
- preserving or restoring bladder tone.
- preventing infection.

A review of some of the principles the nurse will use in achieving these goals follows:

1. A **sterile, closed drainage** system must always be used. **Strict sterile technique** must be used if the collecting system is open.

2. The **flow** must always be downhill and free of obstructions. The tubing can be coiled on the bed so that the drainage tube runs in a straight line to the bag.

3. The **collection bag** should be emptied regularly. It should always be kept **below** the level of the bladder. Clamp the tubing if the catheter must be above the bladder level for some reason.

4. Leg bags should not be used in short-term periods since they greatly increase the risk of infection.

5. The status of the catheter should be routinely assessed for encrustations or crystals by rolling it between the fingers and feeling for gritty materials. If the catheter is in place less than two weeks, routine catheter change is normally not necessary.

6. Avoid unnecessary and excessive manipulation of the catheter.

7. **Meatal care** (that is, the cleansing of the meatus and applying an antimicrobial ointment around the catheter) may have some value. However, recent studies have shown that it does not significantly decrease the rate of urinary tract infection. In fact, covering the moist, warm environment of the meatus may actually promote bacterial growth.

   Certainly the nurse will want to keep the meatus clean and free from encrustations and secretions, the best way to do this **may** be by encouraging **the patient** to carry out a regular cleaning with soap and water, thorough drying, and good hygiene after bowel movements. If the patient can care for her/himself, the risk of cross-contamination will be reduced because fewer people will be handling the

catheter. Each institution, however, has its own policy for providing meatal or catheter care.

8. Of course, the most important weapon the nurse has in preventing infection is conscientious **hand washing** before and after handling any urinary elimination equipment.

9. The nurse should encourage **generous fluid intake** (unless contraindicated) for any patient with a urinary elimination device.

BIBLIOGRAPHY

Potter, P. & Perry, A. (2001). Fundamentals of nursing. (5th ed.). St. Louis: Mosby.

Lewis, S., HeitKemper, M. & Dirksen, S. (2004). Medical-surgical nursing: Assessment and management of clinical problems. (6th ed.). St. Louis: Mosby.

Perry, A. & Potter, P. (2002). Clinical nursing skills & techniques. (5th ed.). St. Louis: Mosby.

Units 6 and 7
Self-Test

COMPLETION

1. Three manifestations of urinary retention to assess for include

   a. _____

   b. _____

   c. _____

2. The female position for catherization is _____

   position, with knees _____, and thighs

   _____

3. _____ _____
   may help to relax the external sphincter when inserting the catheter.

4. If solution remains in the bladder for a period of time, it is called

   _____

TRUE/FALSE

_____ 5. The catheter should be held approximately 6-8 inches from the insertion tip.

_____ 6. Insert only the amount of fluid indicated when inflating the balloon.

_____ 7. An intermittent irrigating setup includes a needle with a syringe.

_____ 8. The collecting bag should be emptied only once every 24 hours regardless of the amount of drainage.

Module 27
Answers to Self-Test

Units 1, 2, and 3

1. c
2. k
3. d
4. j
5. b
6. e
7. a
8. g
9. f
10. h
11. i
12. false
13. true
14. false
15. false
16. true

Units 4 and 5

1. straight
2. irrigation
3. a. 14-16 Fr.
   b. 16-18 Fr.
4. a. tissue erosion
   b. bladder spasm
   c. urine leakage
5. obstruction by mucous, clots, sediment
6. b, e, i
7. a, c, e, h
8. c, e, g
9. d, f

Units 6 and 7

1. a. bladder distention
   b. restlessness
   c. voiding small amounts
   d. abdominal distress
2. supine, flexed, externally rotated
3. deep breathing
4. bladder instillation
5. false
6. true
7. true
8. false