URINARY CATHETER CARE

Abstract

Catheters may be used for various medical purposes. They are inserted to obtain a urine specimen, or to measure urine output. Indwelling catheters are inserted for longer periods of time to address a bladder obstruction, to help prevent skin breakdown, and to maintain an accurate record of fluid intake and output. Catheterization is an invasive procedure that could expose a patient to infection. As a result, proper procedures and sterile technique must be followed for the insertion of the catheter. Care of the urinary catheter system should follow basic rules of infection prevention and the health facility policies of handwashing and to prevent exposure of the patient with an indwelling catheter to infection. The most common complications associated with indwelling urinary catheters are infection, obstruction of the catheter, and trauma.

Learning Objectives

1. Describe the anatomy and physiology of the urinary tract and urinary system
2. Explain clean and sterile technique methods
3. Explain infection control techniques
4. Identify specific techniques that are used to care for a patient with an indwelling urinary catheter.

Introduction

Proper urinary catheter care is an important skill that all certified nursing assistants (CNAs) should be able to perform. There are different types of catheters. This module will discuss care of patients with indwelling catheters. Competence at providing urinary catheter care requires a CNA to understand and apply the following: 1) Basic information about the anatomy and physiology of the urinary tract and urinary system; 2) the sterile technique, 3) infection control techniques; and, 4) specific techniques that are used to care for a patient who has a urinary catheter.

Indwelling Catheters

The word catheter is a medical term that refers to a tube that can be inserted into a body cavity, a body duct, or a blood vessel. There are several types of catheters that can used to drain urine from the bladder: indwelling catheters, sheath catheters (also known as condom or Texas catheters), and straight catheters that are inserted to obtain a urine specimen and then removed.

Indwelling catheters are inserted into the bladder and left in place. A catheter can remain in the bladder for a period of time that depends on the purpose for the procedure and other factors. Some indwelling urinary catheters (suprapubic catheters) are inserted into the bladder through a small incision that is made in the abdominal wall but most are inserted into the bladder through the urethra. A catheter inserted through the urethra is the focus of this section. These catheters are commonly referred to as Foley catheters, or a Foley. Foley is the name of the physician who first designed this type of urinary catheter, which is in common use today.

Some patients who do not have voluntary control of urinary function and need a urinary catheter may be managed using intermittent catheterization. This procedure is often called a straight catheterization. Straight catheterization is also performed when a sterile urine specimen needs to be obtained.

Anatomy and Physiology of the Urinary System

The urinary system forms urine, and the urinary tract stores, transports, and excretes urine. The urinary tract and the urinary system are comprised of these organs and structures:

- Kidneys:

  There are two kidneys. They are located on the right and left sides of the abdominal cavity, and they are approximately at the level of the navel. The kidneys perform several important functions but their primary role is the production of urine.

- Ureters:

  The ureters are short, narrow tubes that originate at the bottom of the kidneys. Each kidney is supplied with one ureter and the function of the ureters is to carry urine from each kidney to the bladder.

- Bladder:

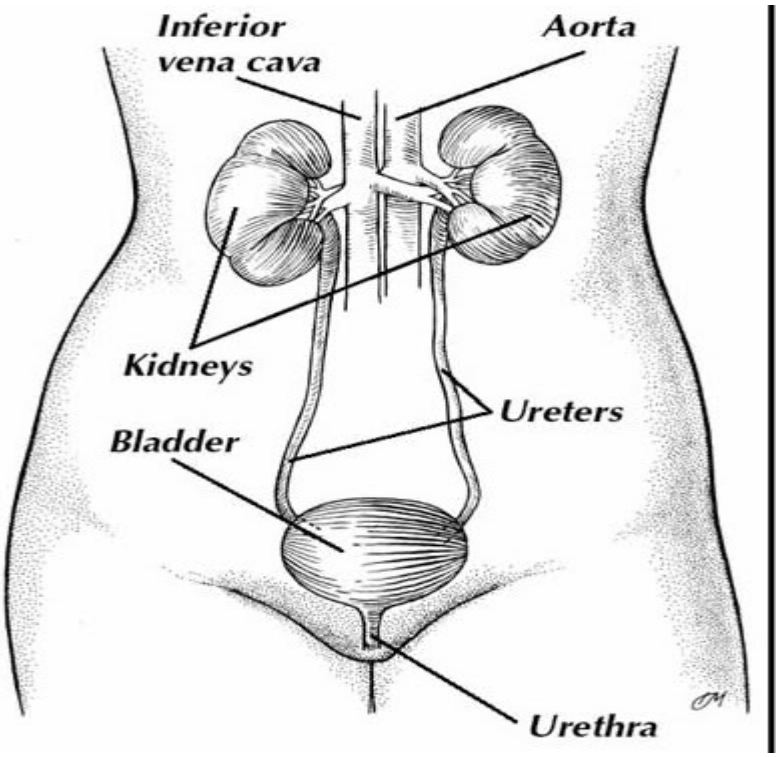
  The bladder is a thin-walled, hollow organ that is similar in shape and size to a small balloon. It is located in the abdominal cavity above the pubic area and below the navel. The function of the bladder is to collect and store the urine that is produced by the kidneys. The bladder can stretch quite a bit, and it can store

approximately 700-800 mL of urine. This is approximately 23-26 ounces. The bladder walls have three layers of smooth muscle. The importance of these muscles is discussed below.

- Urethra:

  The urethra is a small diameter tube that begins at the bottom of the bladder. The purpose of the urethra is to carry the urine from the bladder to external environment. The end of the urethra is called the urethral meatus. In women the urethral meatus is located above the opening of the vagina. In men the urethra travels through the penis and the urethral meatus is located at the tip of the penis.

The Urinary System



The primary functions of the urinary system are to form, store, transport, and excrete urine, and the formation and excretion of urine is one of the ways that the body maintains a healthy internal environment. Excess acids and other waste products that are produced by metabolism are excreted in the urine. Blood urea nitrogen (BUN) and creatinine are waste products that are made when our bodies process proteins and by the normal metabolism of the muscles. Blood urea nitrogen and creatinine are filtered out of the blood by the kidneys and eliminated by the urine. Blood urea nitrogen and creatinine are produced in large amounts, and they can be toxic if their levels in the blood get too high. Blood levels of BUN and creatinine are common laboratory tests that are used to evaluate how well the kidneys and the urinary system are functioning.

Depending on whether the body needs more or less fluid to function properly, the kidneys will produce and eliminate more or less urine. This process can also be manipulated by giving drugs such as diuretics that increase the amount of urine that is produced. This is helpful for people who have medical conditions such as congestive heart failure and/or hypertension.

Proper functioning of the urinary system is critical. If the kidneys cannot filter out waste products and conserve water or get rid of excess water, and if the urinary tract cannot transport the urine and eliminate it, it is impossible for the brain, the circulation, the heart, and other vital organs to function properly.

Urine formation is done by filtering blood that passes through the kidneys. The kidneys have a large blood supply and while a person is

at rest the kidneys receive approximately 25% of all the blood that is pumped by the heart. As the blood passes through the circulation of the kidneys, water and metabolic waste products are filtered out from the blood and pass into collecting tubules in the kidneys; these waste products and the water are, essentially, the urine. The urine moves through the collecting tubules in the kidneys, from the kidneys the urine passes through the ureters and into the bladder, and from the bladder the urine passes through the urethra and is eliminated.

Urination is the process of emptying the bladder and eliminating the urine. Although the bladder can store 700-800 mL of urine, it rarely holds that much. Most people feel the urge to urinate when the bladder contains 200-400 mL of urine. When the level of urine in the bladder reaches that amount, the bladder walls are stretched and this stretch sends a nerve impulse to the brain. The brain in turn sends out a message that stimulates the smooth muscles of the bladder wall and a message to muscles that surround the urethra near the urethral meatus. The bladder walls contract, the muscles around the urethra relax, and urine is passed. This process is referred to as the micturition reflex.

Bladder wall stretch → Nerve impulse to brain→ Smooth muscles contract → Urethra relaxes → Urine is passed

The urinary system is comprised of the kidneys, the ureters, the bladder and the urethra. The primary function of the urinary system is

to produce urine and the production and elimination of urine is one of the ways the body eliminates harmful wastes and conserves or eliminates water. Urine formation occurs in the kidneys, and urination is the process of elimination of urine.

The Indwelling Urinary Catheter System

The indwelling urinary catheter system is comprised of the catheter, the collecting tubing, and the collecting bag. Indwelling urinary catheters are long, narrow tubes made of latex or silicone. The size of urinary catheters is measured using the French system, typically abbreviated as "Fr". Most indwelling urinary catheters are size 14, 16 or 18 French, but larger or smaller ones can be used.

Urinary catheters have two passages called lumens. One lumen is for draining urine and the other is for inflating the balloon that keeps the catheter in place. One end of the catheter tube - the end that inserted into the bladder - has several small openings into the lumen that drains urine, and below these openings is a small, inflatable balloon. This end of the catheter is inserted into the urethra and advanced until it passes into the bladder.

When the catheter is in the bladder and urine begins to flow out, the balloon is inflated and the catheter is gently pulled back until the balloon rests on the bladder wall; this keeps the catheter in the bladder. The openings that are below the balloon drain the urine from the bladder. The other end of the catheter has a large opening that is connected to a collecting tube that is attached to the collecting bag. The collecting bag has a valve at its bottom, which can be opened and closed in order to periodically empty the bag.

Purpose of Indwelling Catheter

There are many reasons why an indwelling urinary catheter would be placed. However, the three most common reasons for insertion of an indwelling urinary catheter are: 1) Bladder outlet when there is obstruction, 2) Prevention of skin breakdown, and 3) Maintaining an accurate record of fluid intake and output.

An indwelling urinary catheter may also be placed if the patient is in intensive care or for some of the following reasons.

Obstruction:

Urinary tract obstructions are relatively common. Obstructions can happen at any point along the urinary tract. A patient who has a chronic obstruction may be able to expel some urine but not empty the bladder completely. A patient may have difficulty starting or stopping the stream, or need to urinate many times during the day. Common causes of urinary obstruction include: 1) swelling of the prostate gland (in men), 2) medication side effects, 3) an infection causing damage to the urinary tract, 4) a kidney stone, 5) reaction to anesthesia used during surgery, 6) a tumor somewhere in the urinary tract, and 7) damage to the nervous system, such as a stroke. Obstructions may be acute or chronic.

Potential for Skin Breakdown:

Patients who have lost bladder control cannot voluntarily determine when they will urinate. The inability to control urinary function is called incontinence.

Having urine in constant contact with the skin is unpleasant, but the consequences of urinary incontinence are far more serious than discomfort. If a patient is incontinent of urine and the skin has prolonged contact with urine, skin breakdown, rashes, pressure ulcers, and other dermatologic problems can occur. Some of these can seriously impact a patient's health. Patients who have chronic urinary incontinence that is caused by a medical condition that cannot be corrected, for example, paralysis from a stroke or an accident, or an obstruction that cannot be medically or surgically corrected may need a permanent indwelling urinary catheter to prevent skin breakdown.

Chemical Paralysis or Sedation:

Some patients need to be chemically paralyzed or heavily sedated; *for* example, patients who are mechanically ventilated need to be sedated for management issues. In these situations, an indwelling urinary catheter is appropriate.

Fluid Monitoring:

In certain clinical situations monitoring a patient's intake and output can be critically important. Examples of these situations would include patients with severe, extensive burns, or patients with serious cardiac problems such as a myocardial infarction or pulmonary edema.

Surgical Considerations:

There many reasons why a patient who is having surgery may need an indwelling urinary catheter. Some patients may be in the operating room for a long time, or they may be undergoing a urologic procedure. The patient may need large amounts of fluids or diuretics during the

procedure. There may be a need for precise recording of intake and output.

Diagnostic or Therapeutic Procedures:

An indwelling urinary catheter may be inserted to deliver medication to the urinary system. One may also be inserted so that radiopaque dyes can be given as part of a diagnostic test.

Significant Pelvic Injury:

In a situation of significant injury to the pelvis, hospice care and the need for comfort would be implemented. Often patients with a traumatic pelvic injury will have continuous urinary catheters in place that require ongoing monitoring.

There are many good reasons for inserting an indwelling urinary catheter but the decision to place an indwelling catheter should be considered seriously, and they should never be placed if there is a reasonable alternative or simply as a convenience for the nursing staff.

Urinary Catheter Insertion

In some U.S. states and in some facilities the Certified Nursing Assistant (CNA) is allowed, after the proper education and supervision, to perform intermittent catheterization and insertion of an indwelling urinary catheter. The two procedures will be briefly reviewed here but the primary focus of this section is about providing care to a patient who has a urinary catheter already in place.

Reading and understanding the information provided here about intermittent catheterization and insertion of an indwelling urinary catheter should not be considered sufficient preparation for performing these procedures. However, a basic understanding is useful for anyone who is caring for a patient who has a catheter in place or who needs intermittent catheterization. The basics of the procedure are simple, but doing it quickly and efficiently does require some coordination, planning, and practice.

Catheterization is an invasive procedure, and it is uncomfortable and possibly embarrassing for the patient. In order to complete the procedure correctly and safely, the following points need to be followed.

- Make sure to have explained the procedure to the patient before starting the procedure; this would include the purpose of catheterization - why it is needed and what is going to be done. The patient's privacy should be maintained at all times.

- Plenty of time should be allowed, and rushing should be avoided.

- It is normal for the patient to feel pressure, discomfort, and a mild degree of pain or irritation when the catheter is being inserted. Before starting the procedure, this should be explained ot the patient.

- It is also normal to need to apply a *slight* degree of pressure to move the catheter through the urethra; force should never be used.

- If a patient is having significant pain or the technician finds that a lot of pressure is needed to advance the catheter, *the procedure*

should be stopped and the CNA should inform a nursing or physician supervisor of the situation. Continuing in those circumstances can easily cause trauma to the urethra.

Intermittent Catheterization

Intermittent catheterization is typically used for people who have a neurogenic bladder. A neurogenic bladder is a bladder that has stopped functioning normally. The most common cause of a neurogenic bladder is a stroke. The stroke causes damage to the part of the brain that controls the muscles and nerves of the bladder and the process of urination cannot longer be voluntarily controlled.

Intermittent catheterization has many advantages for people who have a neurogenic bladder. It can be performed by a family member or by the person who needs it. It avoids the risks and complications of having an indwelling catheter and it helps preserve normal kidney function. Intermittent catheterization also gives the person who has a neurogenic bladder a greater sense of independence.

The procedure of intermittent catheterization can be done in two ways: clean or sterile. Insertion of a urinary catheter has traditionally been considered to be a procedure that required sterile technique. However, at this time there is no evidence that sterile technique is superior to clean technique for performing intermittent catheterization.

Sterile technique is still the mandatory technique for inserting an indwelling urinary catheter. This is because indwelling catheter will typically be in place for several days, which may compromise the

patient's defenses against infection, and create a possible entry point for microorganisms.

Clean Technique:

1. Wash the hands.
2. Lubricate the catheter with water-soluble lubricant. Some urinary catheterization kits are supplied with a lubricating gel that contains a local anesthetic, and this can help the patient tolerate the procedure.
3. Wash the area around the meatus with soap and water. Start at the center and move outward, using a circular motion.
4. For men, position the patient on the back and move the penis so that the tip is pointed towards the patient's head. For women, position the patient on her back and have her legs supported in a comfortable position.
5. Gently insert the catheter and keep advancing it until urine begins to flow.
6. When the desired amount of urine has been drained or the urine stops flowing, slowly remove the catheter.
7. If there is resistance when the catheter is being inserted - this is when the catheter is inserted but it does not easily move forward - do not use force. Simply apply a gentle, steady pressure and in most cases the catheter will advance.

Sterile Technique:

1. Wash the hands.
2. Lubricate the catheter with a water-soluble lubricant.
3. Put on sterile gloves.

4. Use a sterile wipe to clean the meatus and the area around the meatus.
5. Follow Steps 4-6 from the description of clean technique.

Indwelling Catheter Insertion

Indwelling catheter insertion is done using sterile technique. The procedure is done in the same way as intermittent catheterization. The only differences are that the urinary catheter is connected to a drainage bag, and after the catheter has entered the bladder and urine begins to flow, the catheter balloon is inflated.

Urinary catheters are supplied in various sizes. The choice of which French size to use is guided by patient comfort and the physician order. If performing an intermittent catheterization, a small French size would be used to avoid pain and trauma. In most cases a 12 French for women and a 14 French for men is the largest size that should be used for intermittent catheterization, and smaller is always better. An indwelling catheter should usually, but not always, be a little larger in size. The physician who ordered the placement of the indwelling urinary catheter may order a specific size to be used. If not, someone can contact the physician and ask for guidance. The CNA should ask a supervisor which size should be used if this has not been specified.

Basics of Urinary Catheter Care

If a patient has an indwelling urinary catheter, the CNA must know: 1) Why the patient has an indwelling catheter, 2) Concepts of sterile technique and prevention of infection, 3) The complications associated with an indwelling urinary catheter, and 4) Specific techniques that are

used to care for the patient who has a urinary catheter. These techniques may differ depending on where the CNA works but they all have the same goal, which is the prevention of complications and infections.

Maintaining Sterility and Infection Prevention

Sterile technique refers to specific methods that are used to prevent infection when caring for a patient. The term sterile means completely free of microorganisms such as bacteria and viruses. Sterile technique is used in many types of patient care scenarios, but the most common is when the clinical situation or the patient's condition creates a potential entry point into the body for microorganisms. For example, when a patient is undergoing a surgical procedure, the surgeon and the operating room staff will use sterile technique; everything that does or could come in contact with the patient during the surgery should not only be clean, but must be sterile because the integrity of the skin is disrupted and the skin is one of the most important barriers against infection.

In a patient who has an indwelling urinary catheter, the urethra is the entry point for bacteria and viruses. The indwelling catheter enlarges the urethral opening and urination (which normally flushes out microorganisms that are in the urethra) has been disrupted. When caring for a patient who has an indwelling urinary catheter, strict sterile technique is seldom needed, but the CNA must remember that the indwelling catheter is a break in the normal body defenses and certain parts of the system must be considered sterile.

Most aspects of indwelling catheter care do not require sterile technique. However, good infection control practices must always be

followed. This is true when providing care in general for any patient, and the health facility policies for infection control will need to be followed. The presence of the urinary catheter makes patients vulnerable to infection and many of them, because of their advanced age or their medical condition, have a compromised immune system. It is part of the CNA's job to protect them. This section will not provide a detailed discussion of infection control and standard precautions, but the CNA should keep in mind the following points when providing indwelling urinary catheter care for patients.

- Everyone has microorganisms on their skin; they come into contact with microorganisms all the time, and the microorganisms that cause infection can move from one person to another.

- *Contact transmission* is the most important way that microorganisms are spread from person to person in the healthcare setting.

- Handwashing has been recognized by the Centers for Disease Control and Prevention (CDC) as the most important way to prevent the spread of infection.

- Handwashing should be done as follows: 1) before starting patient care, the hands should first be washed, 2) when the hands are visibly soiled, 3) after contact with a patient, 4) after contact with any body secretions, 5) before and after putting on gloves, and 6) before and after using the bathroom.

- Wear gloves when providing urinary catheter care.

Handwashing and barrier protection (wearing gloves) prevent contact transmission of microorganisms from the healthcare worker, or from another patient the healthcare worker has been caring for, to the patient who has an indwelling urinary catheter.

Indwelling Urinary Catheters Complications

The most common complications associated with indwelling urinary catheters are: 1) Infection, 2) Obstruction of the catheter, and 3) Trauma. These will be discussed separately but one can often be the cause of another.

Urinary Tract Infections

An indwelling urinary catheter disrupts one of the patient's normal defenses against infection, and bacterial growth in the urine is common in these patients. After 30 days almost every patient who has an indwelling urinary catheter will have a significant amount of bacteria in the urine. Signs of a urinary tract infection tract include fever, bloody urine, and cloudy, foul-smelling urine. The patient may also complain of pain or irritation in or around the urethra.

Catheter-associated urinary tract infections are a common problem. They are the most common hospital-acquired infection, and they cause significant harm to the patients and add a large financial burden to the healthcare system. Fortunately, catheter-associated urinary tract infections can be prevented, and this can be done by paying strict attention to the following details: 1) Proper insertion of the catheter, 2) Proper care of the catheter, and 3) Proper removal of the catheter.

The first step in preventing a catheter-associated urinary tract infection is to question the need for the catheter and avoid placing one if possible. Studies have shown that between 21-55% of patients who had an indwelling urinary catheter did not need them since there was no appropriate indication for placement of a catheter. Careful evaluation of the patient's need for an indwelling catheter can significantly reduce the number of catheterizations and the number of catheter-associated infections.

If insertion of an indwelling urinary catheter is necessary, the following steps will help prevent infection.

- Strict attention to proper technique will help reduce the risk of infection. Use good handwashing technique before starting the insertion, and use personal protective equipment (PPE) if indicated.
- Make sure that the drainage system is always closed.
- Always keep the drainage tubing in the proper position so that urine flow is not obstructed.
- Keep the drainage bag below the level of the bladder.
- Remove the catheter as soon as possible. Removing an indwelling urinary catheter as soon as possible, preferably within 24-48 hour of insertion, greatly decreases the risk of developing an infection.

Obstruction of the Catheter

Obstruction of urinary catheters is relatively common, as well. Signs and symptoms of catheter obstruction of a blockage include a decrease in urine output and flow, pain, and leakage of urine around the urethral meatus.

Obstruction can happen if there is are mechanical problems with the drainage system, but these can be easily identified and easily prevented with proper positioning of the tubing and the bag. Obstructions are also caused by dehydration. If the patient's fluid intake is less than optimal and dehydration results, the urine becomes concentrated and less diluted than it usually would be. When this happens, sediment that is normally present in the urine also becomes concentrated, the sediment can form a plug, and the catheter becomes obstructed.

A urinary tract infection and/or the presence of microorganisms in the urine or in the drainage lumen of the catheter can also cause an obstruction. The microorganisms that grow in the urine and in the drainage lumen secrete a sticky film that protects them from antibiotics and from the body's immune system. Over time, this sticky film can grow, form plugs in the drainage lumen, and cause and obstruction.

Trauma

The word trauma usually implies something dramatic like a broken bone or a laceration but trauma can happen at levels that cannot be easily felt or seen, and that is the case with trauma associated with an indwelling urinary catheter. The trauma that affects an indwelling urinary catheter happens when tension or traction is inadvertently applied to the catheter or the drainage tubing. These mechanical forces pull the catheter back and forth in the urethra and can damage the tract.

Signs of trauma include bleeding from the urethral meatus, pain or irritation, and leakage of urine. Trauma increases the risk of developing a urinary tract infection, so careful attention must be paid to ensure that the catheter and the drainage tubing are correctly positioned.

Caring for the Patient with an Indwelling Urinary Catheter

The following techniques and responsibilities are the basics of care for a patient with an indwelling urinary catheter.

Cleaning the Catheter Insertion Site

Cleaning of the catheter insertion site should be done at least once a day. The CNA should check the guidelines of the healthcare facility for specific instructions on how often to do this and for the specific way the procedure should be done. The basics of the procedure will generally include: 1) Wash the hands before starting, 2) Wear gloves, and 3) Clean the area using soap and water. The CNA should make sure - especially for female patients - that cleaning near the urethral opening is done from the front towards the back to avoid contaminating the catheter insertion site with bacteria from the rectal area.

Soap and water alone is sufficient for cleaning. Antibacterial soaps, solutions, or ointments do not provide any advantage, nor do antibacterial ointments applied to the area after the cleaning.

Maintain the Sterility of the Indwelling Catheter System

The outside of the indwelling catheter system should be clean, but it is not considered sterile. The inside of the catheter, the inside of the drainage bag, and the connection between the catheter and the drainage bag are considered areas that must be kept sterile. The best way to maintain the sterility of the urinary system is to keep the system closed. The CNA should not disconnect the catheter from the drainage bag tube unless it is necessary to do so.

If the catheter is disconnected from the collecting tubing, the CNA should not touch the tip of the catheter or the collecting tubing. Gloves should be first applied and the CNA should reconnect the catheter and the tubing and immediately notify a supervisor.

Maintaining Catheter Position, Drainage Tube and Collection

The drainage bag should be below the level of the bladder. This will promote drainage and prevent urine from sitting in the collection tubing or moving back into the bladder. The bag should never touch the floor. The collecting tubing should be positioned so that kinks or loops will not develop as these can allow urine to pool and this will increase the risk of an infection.

Studies have shown that kinks or coils in the collection tubing that allow urine to sit in one part of the tubing definitely increase the risk of developing a urinary tract infection. The catheter should be attached to the patient's leg or abdomen and it should be secured so that there is no traction or tension on the catheter. The CNA needs to remember that tension or traction on an indwelling urinary catheter can be painful, and it can cause trauma and/or an infection. Securing the catheter will also prevent it from being accidentally pulled out. The

catheter can be secured using commercially available devices or improvised methods, and it should be secured to either the upper thigh or the abdomen.

Some authorities recommend that indwelling urinary catheters should be secured to the abdomen if the patient is male. The CNA should check the workplace policy on the proper procedure to secure the catheter system. In either case, the catheter attachment and the integrity of the skin where it is attached must be checked at least once every eight hours.

Urine Collection

The urinary drainage bag should be emptied once every 8 hour shift or when the amount of urine in the bag reaches a certain level that will be specified by the workplace guidelines. The CNA should wash his/her hands, put on gloves, avoid touching the drainage bag opening, and drain the urine into a clean container that is used for that patient alone. The CNA should take notice of the color of the urine, look for blood and/or excessive amounts of sediment, note the amount of urine that was collected, and document this information.

Intake and Output

For some patients who have an indwelling urinary catheter, an accurate measurement and recording of intake and output is very important. Urine output is intermittent during the day, but the CNA should know at what point to notify a supervisor, such as if the urine output is less than 30 mL an hour, less than 240 mL for an eight hour period, or if the urine output exceeds a certain level.

Maintaining Good Hydration

Dehydration increases a patient's risk for developing a urinary tract infection and/or a catheter blockage. The CNA should keep close track of the patient's fluid intake and if it is below what the physician has prescribed, a supervisor should be notified.

Case Study: Condom Catheter Leading to Penile Erosion

The following case study was obtained from a PubMed search and describes a case of a 73-year-old male who was bedridden and underwent surgery with erosion of the distal penile skin due to four days of incorrect use of condom catheter.

The authors reported that the patient had a medical diagnosis of hypertension, diabetes mellitus, epilepsy, dilated cardiomyopathy, and chronic kidney disease. The patient received a physical examination and a ring-shaped skin erosion was found on the penis with exposed underlying superficial tissue covered with slough. Blood investigations revealed an elevated white blood cell count suggesting there was infection. As a result, the patient required application of an antiseptic dressing for 2 days with an antibiotic covering and then required circumcision on day 3 without complications.

Discussion

The authors reported that penile strangulation is a rare urological emergency with potentially severe clinical consequences. The occurrence of penile strangulation with tissue damage and slough, as in this case, due to condom catheter is also rare, occurring only a few

times in the medical literature. The clinical presentation will depend on the degree and amount of time of strangulation.

Generally, the caregiver will notice edema or swelling of the distal portion of the penis associated with a decrease in circulation to the skin. In a case of penile strangulation, ulceration will occur and, if the cause of strangulation is not corrected, cutaneous necrosis (tissue death) will occur below the strangulation level. The longer the penile strangulation persists, the more the arterial blood flow becomes compromised, resulting in ischemia and gangrene of the penis.

In an elderly or diabetic male patient there would be a lack of pain signaling and the patient would be unaware of a painful sensation due to the tourniquet effect of the condom catheter. Consequently, early symptoms of possible complications due to condom catheter can be overlooked by the patient and possibly the healthcare staff.
The authors point out that the complications and incidents of condom catheter use are underestimated. Caregivers and the patients and their family members participating in an elderly patient's care should be aware of condom catheter complications and educated about precautions to take to avoid them.

The CNA should be aware that to ensure a comfortable and secure positioning of condom catheter, it is very important to get the appropriate size of the condom catheter. It is also necessary to measure the penile circumference, and measurement should be from the base of the penis where the diameter is the largest to estimate the correct size.

All healthcare staff managing patient care involving a condom catheter should know that it can be difficult at times to choose a correct catheter size. The condom catheter is made to be flexible enough to allow the catheter to properly conform without being too tight. Choosing the largest size could result in urinary leakage.
Before applying the condom catheter, appropriate patient preparation and care involves: 1) cleaning the penis with a neutral pH value soap and water and allowing the penis to dry so that the adhesive may be firmly applied to avoid leaks; 2) trimming the pubic hair away from the base to the penis to stop it from sticking at the condom catheter; 3) noting that the adhesive tape of the condom catheter at the penile base is not applied too tightly; and 4) the skin of the penis should be inspected routinely.
Condom catheters may become dislodged and leaking may occur due to unsuitable size or poor positioning. Adhesive strips resolve the problem of urinary leakage. Cutaneous lesions and allergies and urinary tract infection due to long-term use of condom catheter can also occur.

Condom catheters can be made from different materials. The silicone has been reported to have an advantage of skin tolerance with rare allergic reactions and good skin visibility and any irritation or appearance of skin problem because of the condom catheter translucence.

Repeated interference with the proper use of a condom catheter and urethral catheterization during condom catheter use are associated with an increased risk of urinary tract infection. Penile skin necrosis has been reported to occur in a patient with urinary

incontinence caused by a neurogenic bladder from a spinal cord injury. The skin necrosis was a result of continuous pressure on the penis from the condom catheter. Again, such complications are extremely rare.

This case of a rare penis skin erosion and exposed superficial skin due to strangulation by condom catheter reportedly highlights the importance of careful nursing and CNA care and assistance when a condom catheter is placed for urinary drainage to achieve the best results and to prevent complications.

Summary

Proper urinary catheter care is an important skill that all certified nursing assistants should be able to perform. Several types of catheters can be used to drain urine from the bladder, such as indwelling catheters, sheath (condom) catheters, and straight catheters that are inserted to obtain a urine specimen and then removed. Indwelling catheters are inserted into the bladder and left in place. A catheter can remain in the bladder for a period of time that depends on the purpose for the procedure and other factors.

Trauma can occur that includes bleeding from the urethral meatus, pain or irritation, and leakage of urine, and increases the risk of developing a urinary tract infection. Careful attention must be paid to ensure that the catheter and the drainage tubing are correctly positioned. Competence at providing urinary catheter care for the different types of catheters requires a CNA to understand and apply basic knowledge about the anatomy and physiology of the urinary system, and how to apply sterile technique, infection control techniques, and care for a patient with a urinary catheter.