NURSING PRACTICE & SKILL

Urinary Catheter: Caring for in Patients Following TURP

What is Involved in Urinary Catheter Care Following TURP

› Transurethral resection of the prostate (TURP) is a surgical treatment option for benign prostatic hyperplasia (BPH), a condition common to older men in which increased prostate gland size impedes normal urination. The prostate surrounds the urethra; overgrowth of the prostate gland often results in urethral compression and restriction of urinary flow. Following TURP, it is common for the urologic surgeon to place an indwelling urinary catheter to facilitate irrigation and prevent obstruction due to tissue debris and blood

- *What*: Typically, a triple-lumen urinary catheter **(Figure 1)** is placed transurethrally in order to permit continuous or intermittent closed bladder irrigation (i.e., fluid is instilled in the bladder via a closed drainage system that permits inflow of irrigant and outflow of drainage). Care for patients who have undergone TURP involves regular assessment and cleansing of the catheter and external urethral meatus and monitoring intermittent or continuous bladder irrigation and drainage that is designed to clear blood clots and tissue debris from the urinary tract to prevent catheter blockage. The information that follows focuses on the use of continuous bladder irrigation (CBI) following TURP. (For details about different techniques of bladder irrigation [e.g., closed intermittent irrigation, open manual irrigation], see individual topics in the *Nursing Practice & Skill* series on bladder irrigation)

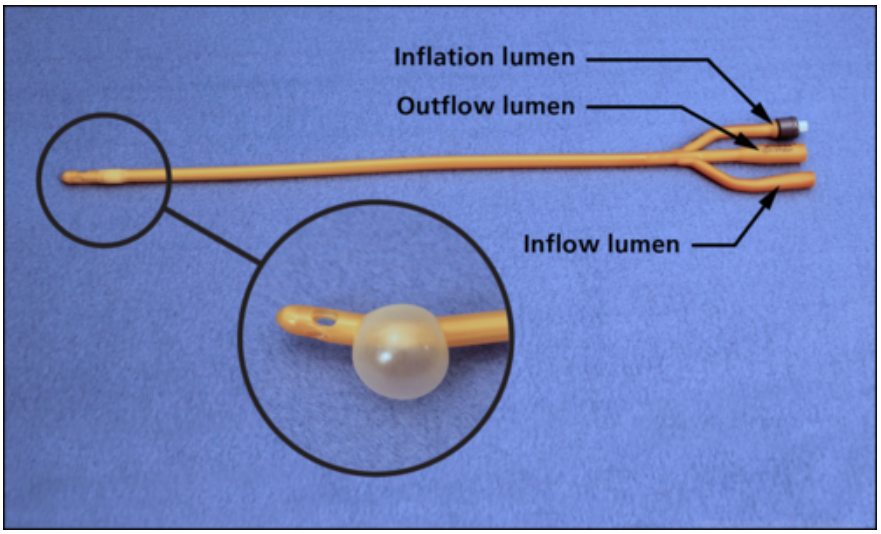

Figure 1: Triple-lumen 22 Fr with inflated balloon.
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- *How*: A closed system of tubing is used to instill irrigant—usually normal saline (NS; i.e., a solution of sterile water and 0.9% sodium chloride)—in the urinary bladder using the inflow lumen of a triple-lumen urinary catheter. Fluid drains from the bladder via the outflow lumen of the catheter to a drainage collection bag. (For information regarding the types of catheters used in bladder irrigation and the flow of irrigant through the drainage system, see *What You Need to Know Before Providing Catheter Care Following TURP*, below). The system is managed using aseptic technique

ICD-9
57.94

ICD-10
Y84.6

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May 5, 2017

- *Where*: TURP is an inpatient surgical procedure that is indicated for patients whose BPH manifestations do not resolve with conservative management. Catheter-related care, including CBI, is provided in the inpatient setting (e.g., postsurgical unit)
- *Who*: Physicians and nurse clinicians in the postsurgical care unit provide urinary catheter care following TURP, and postoperative care is performed by licensed clinicians. Although assistive clinical staff may be involved in measuring urinary output, the responsibility of adding irrigation fluid to the system, performing patient assessment, and monitoring the irrigation/drainage system should not be delegated to assistive staff members

What is the Desired Outcome of Urinary Catheter Care Following TURP?

› The desired outcome of urinary catheter insertion following TURP is to allow the bladder and prostate to rest following surgery and to maintain catheter patency by flushing tissue, clots, mucous fragments, and sediment, which can obstruct the catheter and prevent the normal drainage of urine, tissue debris, and blood

› Catheter care is performed regularly on all patients with a urinary catheter to confirm that the system is intact and to prevent the proliferation of bacterial microorganisms that can lead to urinary tract infection (UTI)

Why is Urinary Catheter Care Following TURP Important?

› The urinary tract is susceptible to blockage due to postsurgical bleeding, clots, and tissue debris. CBI promotes system patency by reducing the complications associated with urinary tract obstruction (e.g., pain, urinary tract infection, loss of renal function, and potentially sepsis or death)

› Closed bladder irrigation permits access to the bladder without disrupting and potentially contaminating the closed drainage system)

Facts and Figures

› As many as 14 million men in the United States and 30 million men worldwide have signs and symptoms of BPH, which occur as part of normal physiologic aging. As men age, there is an increase in prostate epithelial cell death and these cells accumulate, which results in an increase in the size of the prostate gland. Half of men by age 50, 70% of men by age 70, and 90% of men by age 85 have histologic signs of BPH. About 17% of men develop associated bladder outlet obstruction and lower urinary tract signs and symptoms. The severity of hyperplasia is hormonally dependent; men with higher testosterone and dihydrotestosterone levels develop more significant prostate enlargement than men with lower levels of these hormones. Men of all races develop BPH, but signs and symptoms tend to be more severe in Black men, likely due to higher hormone levels (Deters et al., 2014; Wasson, 2000; Hollingsworth et al., 2014)

› Researchers in a small study in Turkey involving 66 men who underwent TURP reported that recatheterization due to hemorrhage or other complications was necessary in 5 patients whose catheters were removed on postoperative day 1, and in 1 patient whose catheter was removed on postoperative day 2. None of the patients who had catheters removed on the third postoperative day required recatheterization, leading the investigators to conclude that although early catheter removal promotes earlier patient discharge and lowers risk for healthcare-associated infection, later removal lowers the risk for recatheterization (Sahin et al., 2011)

What You Need to Know Before Providing Catheter Care Following TURP

› Before providing care for a patient following TURP, the nurse clinician should be familiar with the following:

- Anatomy and physiology of the urinary system **(Figure 2)** **(Figure 3)**
- The kidneys perform the primary filtering function of the urinary system. The two bean-shaped organs are primarily retroperitoneal (i.e., located behind the peritoneum that lines the abdominal cavity). They are held against the posterior abdominal wall and are partially protected by the lower ribs
  - A ureter drains from the renal pelvis of each kidney to the bladder. Urine moves to the bladder via peristaltic wave-like motion of the smooth muscle walls
    - The prostate gland, which is normally a chestnut-sized gland, is located anterior to the rectum and just below the bladder. The prostate surrounds the urethra; overgrowth of the gland often results in urethral compression and restriction of urinary flow, a condition that is referred to as bladder outlet obstruction
    - BPH that necessitates surgical correction is characterized by persistent urinary obstruction that does not improve with pharmacologic treatment (e.g., alpha-1 receptor blockers [e.g., doxazosin] or 5-alpha reductase inhibitors [e.g., finasteride])
  - The bladder is a hollow muscular reservoir. Adult bladder capacity of 500 mL is reached at 14–18 years of age

– The urethra extends from the neck of the bladder through the pelvic diaphragm to the external urethral orifice. In a functioning bladder, when urine volume in the bladder reaches a certain level, impulses cause a reflex contraction of the bladder and the urethral sphincter relaxes to permit urine flow
  - The urethra lengthens during physical development in males and females. The urethra extends from the bladder to the external urethral orifice. A sphincter that controls urine flow is located near the bladder

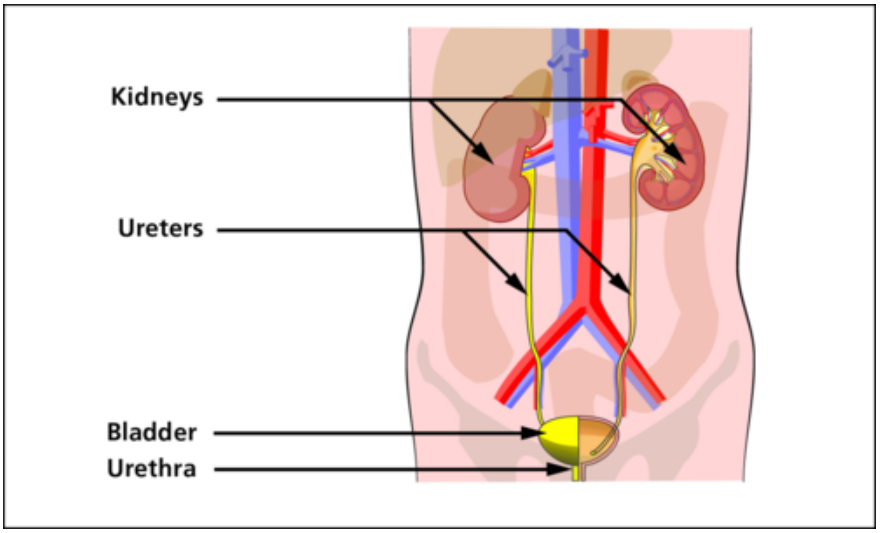

Figure 2: Urinary system. Copyright© Jordi March iNogué, 2010. Licensed under Creative Commons Attribution-Share Alike 3.0 Unported License

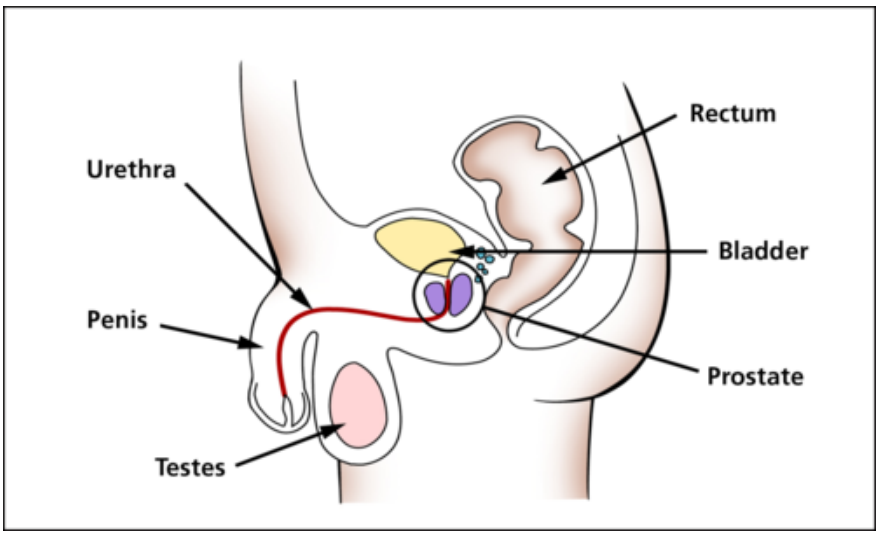

Figure 3: Transverse view of male pelvis. This image is in the public domain in the United States

• There are several types of urinary catheters available for bladder irrigation
  – Single-lumen catheters are typically used for straight or intermittent catheterization and are not commonly used to irrigate the bladder
  – Double-lumen catheters (i.e., one lumen is used to inflate the balloon that secures the catheter in the bladder, the second lumen permits urinary drainage [e.g., Foley or Coudé catheters]) can be used for open intermittent irrigation or for manual irrigation. A Foley catheter is the most commonly used dual-lumen indwelling urinary catheter. If the urologist has inserted a standard double-lumen indwelling catheter, it will be necessary to perform intermittent irrigation
  – Triple-lumen catheters (i.e., a double-lumen catheter with the addition of a third lumen to permit irrigation) can be used for closed continuous or intermittent bladder irrigation. The triple-lumen catheter has three lumen
    - An inflation lumen permits inflation of the balloon that is used to secure the catheter in the bladder
    - An inflow lumen allows for instillation of fluid in the bladder
    - An outflow lumen allows for bladder drainage
• Familiarity with the set-up for continuous bladder irrigation **(Figure 4)** :
  – Irrigant flows in the triple-lumen catheter via the inflow lumen, through the urethra, and to the bladder
  – Drainage flows from the bladder through the outflow lumen of the urinary catheter to the drainage collection bag

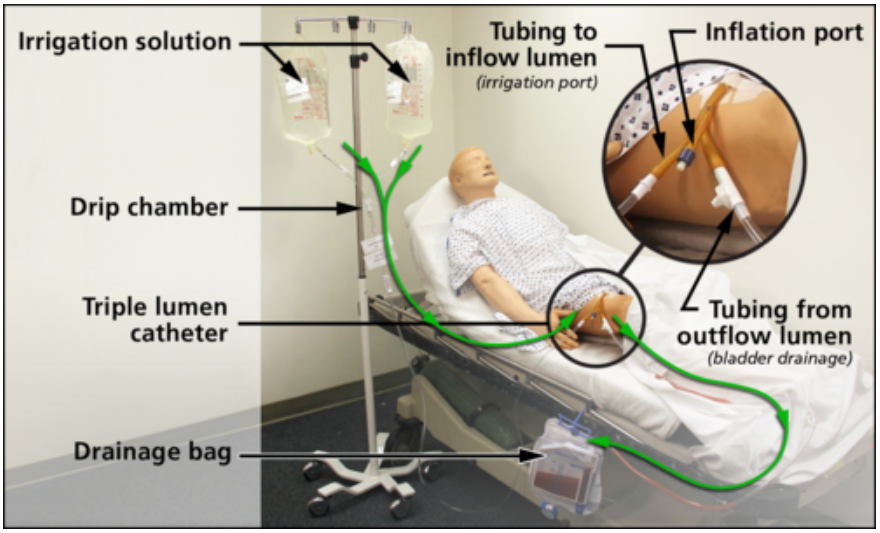

Figure 4: Overview of continuous bladder irrigation set-up.Copyright©2014, EBSCO Information Services

- Understanding that NS is the preferred fluid for CBI. Sterile water is not recommended because it can be absorbed from the bladder and dilute systemic electrolytes. Most additives (e.g., antibiotics) are more easily administered if NS is used as the irrigant, although checking for compatibility is important (e.g., Amphotericin B is not compatible with NS)
- Knowledge of standard precautions in health care and demonstrated competence in adherence to aseptic technique are necessary
  - Knowledge of the appropriate technique to be used is important. The technique used for catheter care is a form of aseptic technique known as general aseptic non-touchtechnique (ANTT). Using ANTT, the skin is not touched after it has been prepared with antiseptic cleanser,and the sterile part of the item/equipment does not come in contact with anything that is not sterile prior to introduction to the patient
- Competence in assessment of the urinary system, including monitoring intake and output, is essential
  - Following the TURP procedure, it is normal for patients to have blood-tinged (e.g., "rose-colored") urine, pass blood clots, and have a small amount of bloody discharge from the urinary meatus postoperatively for the first 24 hours. However, a continuous flow of bright red urine, a large amount of clots, or thick, dark red urine indicates active bleeding and must be reported immediately to the treating clinician
  - The treating clinician may order gentle traction on the catheter to prevent or slow postoperative bleeding
    - If catheter traction is ordered, apply traction by pulling the catheter tubing taut and taping the catheter to the patient's leg or affixing it to the leg using a leg strap. The patient should be instructed to keep his leg straight in order to maintain sufficient traction. Periodically release the traction to reduce causing damage to the urinary sphincter
  - Typically, bladder irrigation is discontinued after resolution of hematuria or if only slightly blood-tingedurine is observed for 24–48 hours
- Awareness of the basic components of the prostatectomy procedure, which typically involves separating the prostate from the urethra and removing the prostate, prostatic urethra, and in some cases the seminal vesicles, and anastomosing the membranous urethra to the bladder neck. The indwelling catheter is usually left in place for the 10–14 days typically required for urethral healing

› Knowledge of potential complications of TURP is important (for details, see *Red Flags* , below)

› Preliminary steps that should be performed before initiating TURP-relatedcare include the following:

- Review the facility/unit specific protocol for TURP-related care, if one is available
  - Note the frequency the urinary meatus should be cleansed and the type of facility-approved skin cleanser to be used
- Review the treating clinician's order for TURP-related care
  - Note the type of irrigant, rate of infusion, additives, and if urinary specimens are required for laboratory analysis
- Review the manufacturer's instructions for all equipment to be used and verify that the equipment is in good working order
- Verify completion of facility informed consent documents
  - Typically, the general consent for treatment that is executed by patients at admission to a healthcare facility or the surgical consent forms include standard provisions that encompass TURP-related care
- Review the patient's medical history/medical record for information about allergies (e.g., to latex, medications, or other substances); use alternative materials, as appropriate

› Gather supplies for CBI, which typically include the following **(Figure 5)** :

- Nonsterile gloves; additional personal protective equipment (PPE; e.g., gloves, gown, mask, eye protection) may be needed if exposure to body fluids is anticipated
- Facility-approved pain assessment tool, prescribed analgesia, and means for its administration
- Sterile NS. Typically, NS is available in larger, specially sized irrigation bags (3,000–4,000 mL) to reduce the frequency at which the bags must be replaced during CBI
  - Check the expiration date of the NS to confirm that the fluid remains effective
- Facility-approved antiseptic (e.g., chlorhexidine gluconate [CHG] with alcohol, povidone-iodine)
- Bladder irrigation set
  - Although a single-tubing irrigation set is functional, many clinicians prefer to set up a primary and alternate irrigation bag system so that the second bag can serve as a back-up when the first bag is empty. This system requires a "Y" connector so the two irrigation bags can be connected to the irrigation set
- 4 x 4 sterile gauze
- Adhesive tape, a securement device (e.g., StatLock, which is an adhesive-based securement device;a Velcro locking system such as Catheter Tube Holder Strap or Catheter Leg Strap), or elastic straps to secure the urinary catheter to the patient's thigh
- I.V. pole
- Additive for solution; if additives to the irrigant are ordered, collect the additive, syringe, and sterile needle or needleless cannula necessary for injecting the additive
  - Check the expiration date of the additive, and confirm that the additive is compatible with the irrigant
- Labels or materials to prepare labels that state "NOT FOR I.V. INFUSION" and "BLADDER IRRIGATION ONLY"

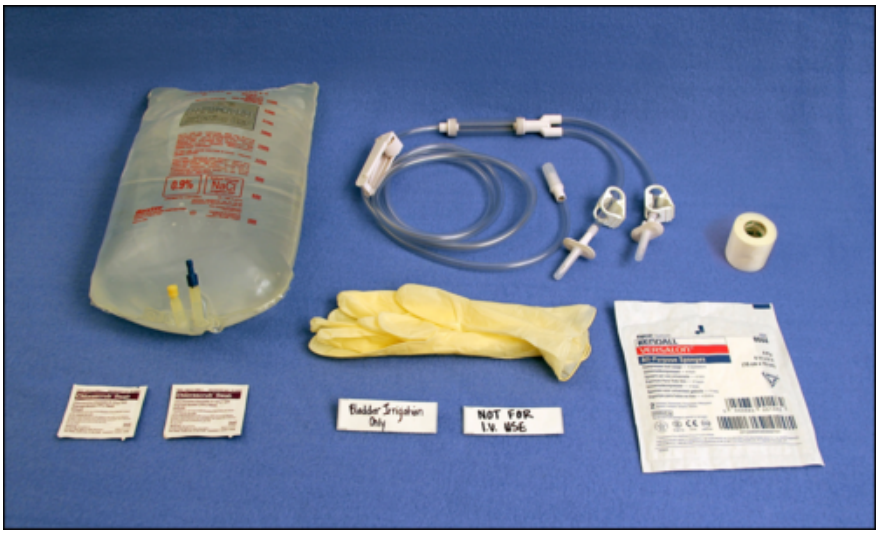

Figure 5: Supplies required for continuous bladder irrigation. Copyright©2014, EBSCO Information Services

How to Provide Urinary Catheter Care Following TURP

› Perform hand hygiene and don nonsterile gloves and other PPE, if appropriate
› Identify the patient according to facility protocol
› Establish privacy by closing the door to the patient's room and/or drawing the curtain surrounding the patient's bed
› Introduce yourself to the patient and family member(s), if present, and explain your clinical role; assess for knowledge deficits and anxiety regarding CBI
- Determine if the patient/family requires special considerations regarding communication (e.g., due to illiteracy, language barriers, or deafness); make arrangements to meet these needs if they are present
  - Use a professional certified medical interpreter, either in person or via phone, when a language barrier exists
- Explain the procedure, its purpose, and what outcome to expect from the procedure; answer questions and provide emotional support as needed

› Position the patient for privacy, comfort, and accessibility; raise the bed to a height that offers optimal access to the urinary catheter and lower the side rail
› Assess the patient's general health status, including his pain level using a facility-approved pain assessment tool. Administer prescribed analgesia, as appropriate, and allow sufficient time for a therapeutic level to be reached before continuing with the procedure
› Percuss the bladder for distention to provide baseline information

- A dull (i.e., flat) sound without echo is indicative of fluid, and a tympanic (i.e., higher-pitched sound) indicates the presence of air. Because it is usually not possible to percuss the bladder unless it is distended above the symphysis pubis, assess how high the bladder rises above the symphysis pubis

› Set up the CBI system according to the facility/unit specific protocol and while maintaining general ANTT to avoid contaminating the system. Typical steps are as follows:

›

- Confirm proper functioning of the urinary catheter by observing drainage in the collection drainage unit. **Do not begin CBI unless urine is draining freely**
- Empty the drainage bag and assess urine output
- Place an absorbent pad on the bed beneath the urinary catheter to prevent leakage on the bed linens
- Insert an additive in the irrigant, if prescribed
- Close the clamps on the bladder irrigation set
- Connect/spike the bladder irrigation tubing to the NS-filledirrigation bags
- Hang the irrigation bags on the I.V. pole approximately24–36inches/2–3 feet/60–90 cm above the bladder to promote gravitational flow **(Figure 6)**

Figure 6: Hang the irrigation bags approximately 24–36 inches/61–91cm above the patient's bladder to promote gravitational flow. Copyright©2014, EBSCO Information Services

- Slowly open the clamp to one of the irrigation bags to prime the tubing
- Pinch the fluid chamber until the chamber is filled halfway; close the clamp to the primed tubing
- Open the clamp to the alternate irrigation bag and prime the tubing; close the clamp once primed
  - When instilling the irrigation, verify that only one of the clamps is open at a time to avoid fluid exchange between the irrigation bags
- Label the irrigant bags/tubing with information regarding the type of solution, additives, date, and time the solution was opened, and add caution labels (e.g., "NOT FOR I.V. INFUSION" and "BLADDER IRRIGATION ONLY") **(Figure 7)**
  - Some facilities require placement of the "NOT FOR I.V. INFUSION" label in several locations (e.g., proximal to the irrigation tubing spike and at the distal end of the irrigation tubing near the Foley connection)

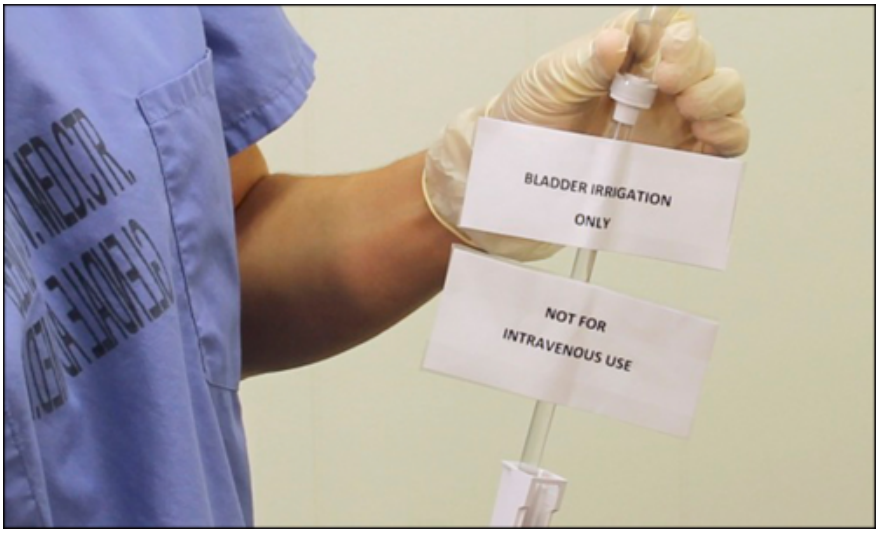

Figure 7: Label the bladder irrigation tubing with a sticker stating “NOT FOR I.V. INFUSION” and “BLADDER IRRIGATION ONLY”. Copyright©2014, EBSCO Information Services

- Swab the irrigation port with CHG or other facility-approvedantiseptic cleanser and allow to air dry
- If the inflow/irrigation port has a plug, use sterile gauze to remove the plug; discard the plug
- Connect the irrigation tubing to the inflow lumen of the urinary catheter
- Slowly open the clamp to one of the irrigation bags, and set the rate of infusion in accordance with the treating clinician’s order

› Observe the drainage in the drainage bag to verify catheter patency **(Figure 8)** . Maintain the drainage bag below the level of the bladder at all times to promote drainage by gravity

Figure 8: Observe for drainage in the drainage collection bag and the rate of infusion in the drip chamber of the irrigation set. Copyright©2014, EBSCO Information Services

› Secure the catheter and tubing to prevent movement and traction against the urethra that could damage urethral tissue. In the event traction against the bladder outlet is ordered to stop urethral bleeding, follow the treating clinician’s orders and avoid excessive traction to reduce the risk of tissue damage. Typically the catheter is strapped or taped to the patient’s thigh using a commercial securement device, and the drainage tubing is clipped to the mattress or to the bed frame. Avoid dependent loops or kinks to permit unobstructed urine drainage, and do not attach the drainage bag to the rail of the bed due to the risk. Allow for enough slack in the drainage tubing so the patient can move his thigh without pulling the catheter

- Some clinicians choose to create a reverse “gutter” with adhesive tape to reduce tubing tension against the skin. The reverse “gutter” technique can be prepared with three pieces of tape as follows **(Figure 9)** :
  - Center one piece of tape over the catheter/drainage bag tubing, pinch the edges together to create a short tab, and extend the ends of the tape over the patient’s thigh. The reverse gutter created by elevating the catheter/tubing above the thigh with tape reduces traction against the skin and the urethra
  - Place the two remaining pieces of tape over the tape on the patient’s skin

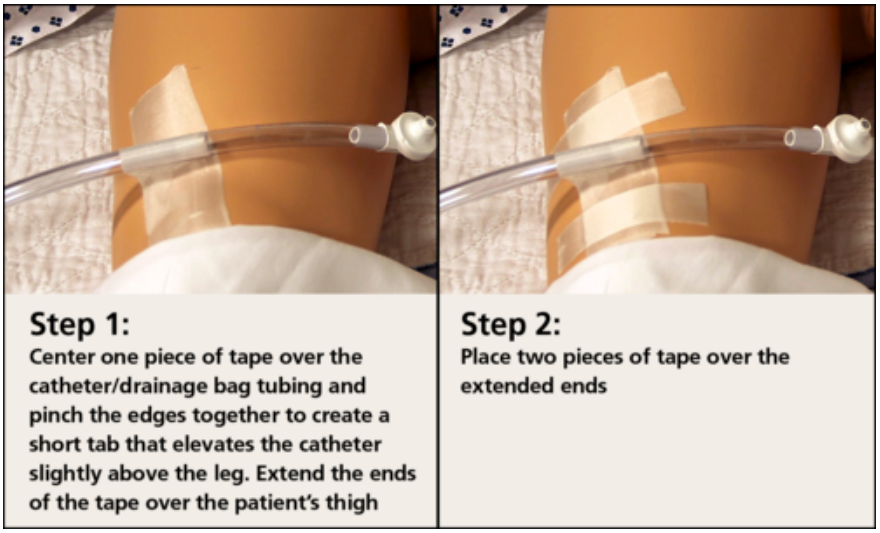

Figure 9: Secure the urinary catheter to the patient's thigh using the reverse gutter technique. Copyright©2014, EBSCO Information Services

- **Do not attach the drainage bag to the bedrails because this could result in the catheter being pulled when the bedrails are lowered or raised**

› Remove the absorbent pad from the bed, raise the side rail, and lower the height of the bed to the lowest position

› Dispose of used materials in proper receptacles and perform hand hygiene

› Continued management of the CBI includes

- observing for adequate urinary output and return of irrigation solution
- monitoring for tissue, clots, mucous fragments, and sediment in the drainage collection unit
- continuing irrigation as ordered depending on the degree of hematuria that is considered acceptable by the treating clinician
- performing regular urinary catheter care (e.g., cleaning the urinary meatus and penis as appropriate and at the frequency stated in the facility/unit specific protocol; changing urinary catheter tubing every 96 hours or as specified by facility protocol). For more information see *Nursing Practice & Skill ... Urinary Catheter: Care*
  - It is common to cleanse the urinary meatus and urinary catheter twice daily
    - Perform hand hygiene and apply nonsterile gloves
    - Using soap and water, cleanse the meatus and the catheter itself. Be sure to remove accumulated drainage or blood from the meatus
- calculating and recording accurate input and output (I & O)
  - The amount of irrigant infused via the urinary catheter should be subtracted from the total fluid emptied from the drainage collection unit to obtain an accurate measure of urinary output. For example:

Total amount of drainage in drainage collection bag:	4,127 cc
Total amount of irrigant:	– 3,000 cc
Total patient output:	1,127 cc

  - It is prudent practice to empty the drainage collection bag after each irrigation bag is completely used and before the next irrigation bag is started. This practice minimizes the potential for inaccurate I & O calculations
- collecting urine specimens for laboratory testing

› Assist the urologist in removing the urinary drainage catheter after a designated time has elapsed (usually after 72 hours) and the urine has begun to be clear. (For information, see *Nursing Practice & Skill ... Urinary Catheter, Indwelling: Removing*)

› Update the patient's plan of care and document CBI in the patient's medical record, including the following information:

- Date and time CBI was initiated
- Description of the procedure, including administering additives to the irrigant
  - Additives to irrigant should be documented in the medication administration record (MAR)

- Patient assessment findings, including
  - level of pain, analgesia administered, and treatment efficacy
  - abdominal assessment and degree of bladder distention
  - urine volume and characteristics (e.g., color, clarity, odor, degree of hematuria, and presence of clots, tissue, sediment, and mucous threads)
  - I & O data, including the amount of irrigant infused and total urine output
- Laboratory specimens collected and sent for analysis
- Patient's response to CBI, including pain/discomfort
- Any unexpected patient events, interventions performed, whether or not the treating clinician was notified, and patient outcome
- All patient/family member education provided, including topics presented, response to education, plan for follow-up education, barriers to communication, and techniques that promoted successful communication

Other Tests, Treatments, or Procedures That May be Necessary Before or After Providing Catheter Care Following TURP

› The urinary catheter and drainage system will be changed according to facility protocol or as required by orders of the treating clinician
- Many facilities restrict recatheterization of patients following urologic surgery to physicians and advanced practice clinicians

› Manual (i.e., open) bladder irrigation or replacement of the urinary catheter can be necessary if the urinary catheter becomes blocked and patency cannot be restored. Contact the urologist if the catheter becomes obstructed and cannot be cleared with irrigation

› After bladder irrigation is complete, the patient should be encouraged to walk to facilitate recuperation

› A bladder scan or ultrasound may be ordered to assess post-void residual

What to Expect After Providing Catheter Care Following TURP

› Bladder irrigation will be performed without adverse effects (e.g., infection related to a break in aseptic technique)

› The urinary catheter remains patent and bladder drainage is uninterrupted; clot formation in the urinary bladder and urinary catheter is prevented or minimized

› The patient's comfort is maintained

› Signs or symptoms of UTI or other complications of urinary catheterization will be promptly identified and treated

Red Flags

› Bladder irrigation is usually performed using gravitational force instead of an infusion pump due to the risk of stress on internal surgical suture lines if excessive force is used during instillation

› In the event of catheter obstruction, CBI should be stopped immediately to prevent patient discomfort and the complications associated with bladder distention (e.g., excessive stretching, tearing, rupture, urine reflux to the ureters and the kidneys, sepsis, renal failure). Signs and symptoms of catheter obstruction include
- diminished or absent urine flow, assuming adequate hydration
- suprapubic distention
- severe lower abdominal discomfort
- fluid leakage at the perineal area, which is evidence of fluid bypassing the urinary catheter
- diaphoretic, tachycardic, hypotensive signs and symptoms, with vasovagal episodes that can occur with advanced bladder distention

› Catheter displacement is often the result of balloon dysfunction or deflation. The most obvious sign of catheter displacement is an increase in the length of the catheter extending from the patient's urinary meatus or penis

› Postoperative complications in patients who have undergone TURP include
- hemorrhage
- bladder spasm, particularly with irrigation
- urinary retention
- blockage of the urinary catheter
- skin breakdown in the area of the urinary meatus or lower extremities due to friction from the catheter or urinary drainage bag tubing

- urethral injury, which can occur during insertion or due to pulling on the catheter
  – Traction should never be applied to the catheter unless ordered by the treating clinician
- UTI and/or septicemia due to a break in asepsis or insufficient or improper catheter care
- displacement of the catheter due to deflation of the catheter balloon, which is indicated by an increase in the length of the catheter that is visible outside the urinary meatus
- TURP syndrome, which is a **medical emergency** characterized by dilutional hyponatremia caused by absorption of irrigation fluid during surgery

What Do I Need to Tell the Patient/Patient's Family?

› Encourage the patient to drink 2–3 liters of fluid daily to reduce the risk of dysuria and to clear hematuria
› Reinforce patient education regarding what to expect after TURP and indications for catheter placement and care
› Educate the patient about what to expect after the catheter is removed
- Explain that pink or blood-tinged urine and burning on urination is normal following removal of the indwelling catheter. Educate to notify the treating clinician of bloody urine, multiple blood clots, or difficult urination
- Reinforce the importance of adherence to the treating clinician's postoperative instructions and keeping follow-up appointments

Note

› Recent review of the literature has found no updated research evidence on this topic since previous publication on September 25, 2015

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