48 Urinary Elimination

LEARNING OUTCOMES

After completing this chapter, you will be able to:

1. Describe the process of urination, from urine formation through micturition.
2. Identify factors that influence urinary elimination.
3. Identify common causes of selected urinary problems.
4. Describe nursing assessment of urinary function, including subjective and objective data.
5. Identify normal and abnormal characteristics and constituents of urine.
6. Develop nursing diagnoses and desired outcomes related to urinary elimination.
7. Describe nursing interventions to maintain normal urinary elimination, prevent urinary tract infection, and manage urinary incontinence.
8. Delineate ways to prevent urinary infection.
9. Explain the care of clients with retention catheters or urinary diversions.
10. Verbalize the steps used in:
    a. Applying an external urinary device.
    b. Performing urinary catheterization.
    c. Performing bladder irrigation.
11. Recognize when it is appropriate to delegate aspects of urinary elimination to unlicensed assistive personnel.
12. Demonstrate appropriate documentation and reporting of applying an external catheter, performing urethral urinary catheterization, and performing bladder irrigation.

KEY TERMS

anuria, *1180*
bladder retraining, *1188*
blood urea nitrogen (BUN), *1184*
CAUTI, *1191*
creatinine clearance, *1184*
Credé's maneuver, *1191*
detrusor muscle, *1175*
dialysis, *1180*
diuresis, *1179*
diuretics, *1179*
dysuria, *1181*
enuresis, *1176*
flaccid, *1191*
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urinary retention, *1181*
urination, *1176*
vesicostomy, *1202*
voiding, *1176*

INTRODUCTION

Elimination from the urinary tract is usually taken for granted. Only when a problem arises do most people become aware of their urinary habits and any associated symptoms.

A person's urinary habits depend on social culture, personal habits, and physical abilities. In North America, most people are accustomed to privacy and clean (even decorative) surroundings while they urinate.

Personal habits regarding urination are affected by the social politeness of leaving to urinate, the availability of a private clean facility, and initial bladder training. Urinary elimination is essential to health, and voiding can be postponed for only so long before the urge normally becomes too great to control.

PHYSIOLOGY OF URINARY ELIMINATION

Urinary elimination depends on the effective functioning of the upper urinary tract's kidneys and ureters and the lower urinary tract's urinary bladder, urethra, and pelvic floor (Figure 48–1 ■).

Kidneys

The paired kidneys are situated on either side of the spinal column, behind the peritoneal cavity. The right kidney is slightly lower than the left due to the position of the liver. They are the primary regulators of fluid and acid–base balance in the body. The functional units of the kidneys, the nephrons, filter the blood and remove metabolic wastes. In the average adult 1,200 mL of blood, or about 21% of the cardiac output, passes through the kidneys every minute. Each kidney contains approximately 1 million nephrons. Each nephron has a **glomerulus**, a tuft of capillaries surrounded by Bowman's capsule (Figure 48–2 ■).

The endothelium of glomerular capillaries is porous, allowing fluid and solutes to readily move across this membrane into the capsule. Plasma proteins and blood cells, however, are too large to cross the membrane normally. Glomerular filtrate is similar in composition to plasma, made up of water, electrolytes, glucose, amino acids, and metabolic wastes.

From Bowman's capsule the filtrate moves into the tubule of the nephron. In the proximal convoluted tubule, most of the water and electrolytes are reabsorbed. Solutes such as glucose are reabsorbed in

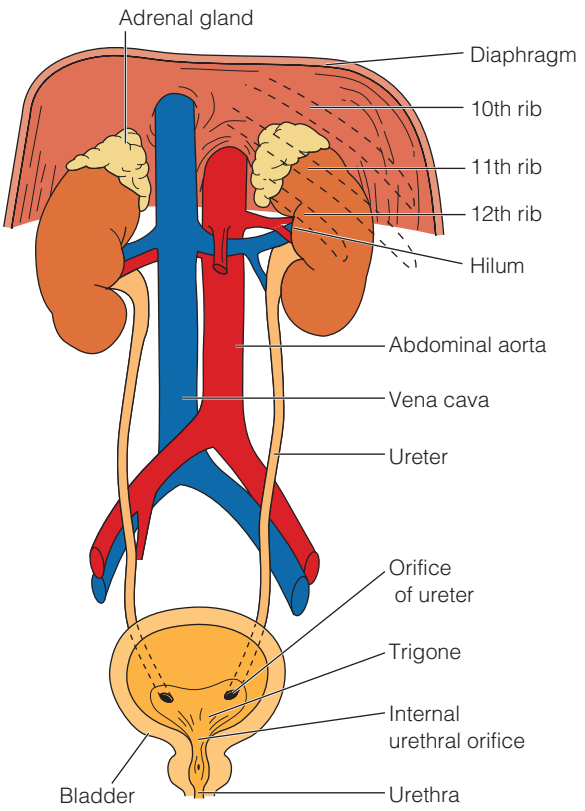


Figure 48–1 ■ Anatomic structures of the urinary tract.

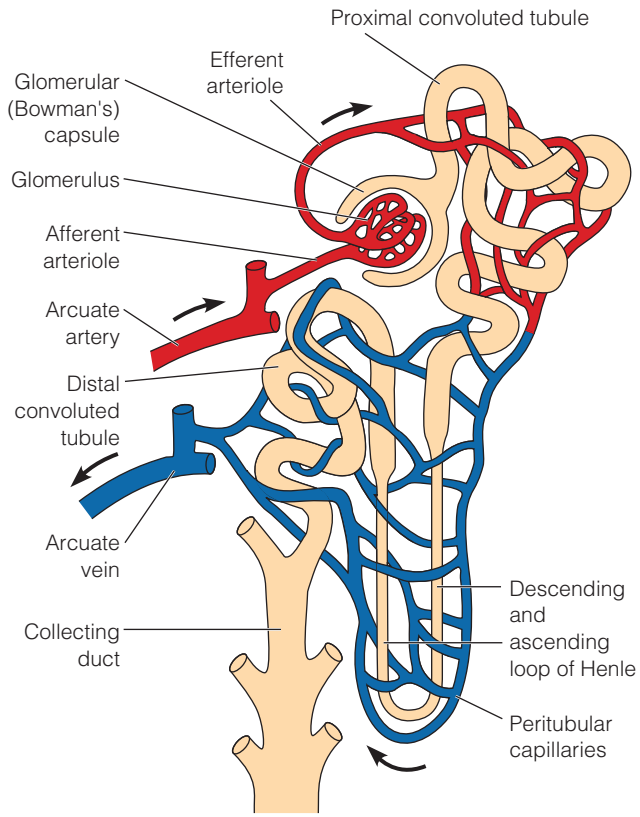


Figure 48–2 ■ The nephrons of the kidney are composed of six parts: the glomerulus, Bowman's capsule, proximal convoluted tubule, loop of Henle, distal convoluted tubule, and collecting duct.

the loop of Henle. Other substances are secreted into the filtrate in the same area, resulting in concentrated urine. In the distal convoluted tubule, additional water and sodium are reabsorbed under the control of hormones such as antidiuretic hormone (ADH) and aldosterone. This controlled reabsorption allows regulation of fluid and electrolyte balance in the body. When fluid intake is low or the concentration of solutes in the blood is high, ADH is released from the posterior pituitary, more water is reabsorbed in the distal tubule, and less urine is excreted. By contrast, when fluid intake is high or the blood solute concentration is low, ADH is suppressed. Without ADH, the distal tubule becomes impermeable to water, and more urine is excreted. When aldosterone is released from the adrenal cortex, sodium and water are reabsorbed in greater quantities, increasing the blood volume and decreasing urinary output.

Ureters

Once the urine is formed in the kidneys, it moves through the collecting ducts into the calyces of the renal pelvis and from there into the ureters. In adults the ureters are from 25 to 30 cm (10 to 12 in.) long and about 1.25 cm (0.5 in.) in diameter. The upper end of each ureter is funnel shaped as it enters the kidney. The lower ends of the ureters enter the bladder at the posterior corners of the floor of the bladder (see Figure 48–1). At the junction between the ureter and the bladder, a flaplike fold of mucous membrane acts as a valve to prevent **reflux** (backflow) of urine up the ureters.

Bladder

The urinary bladder (vesicle) is a hollow, muscular organ that serves as a reservoir for urine and as the organ of excretion. When empty, it lies behind the symphysis pubis. In men, the bladder lies in front of the rectum and above the prostate gland (Figure 48–3 ■); in women it lies in front of the uterus and vagina (Figure 48–4 ■).

The wall of the bladder is made up of four layers: (1) an inner mucous layer; (2) a connective tissue layer; (3) three layers of smooth muscle fibers, some of which extend lengthwise, some obliquely, and some more or less circularly; and (4) an outer serous layer. The smooth muscle layers are collectively called the **detrusor muscle**. The detrusor muscle allows the bladder to expand as it fills with urine, and to contract to release urine to the outside of the body during voiding The **trigone** at the base of the bladder is a triangular area

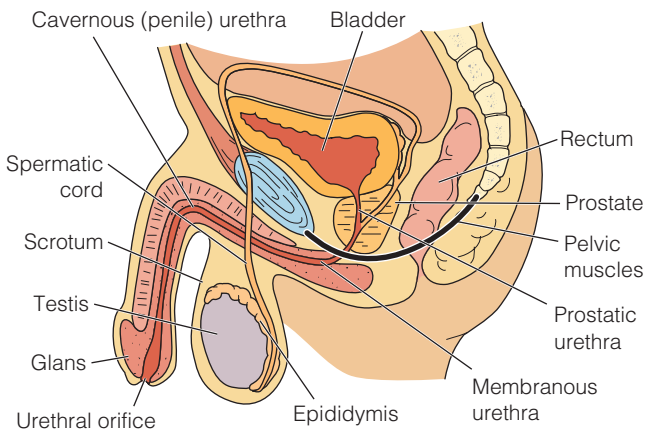


Figure 48–3 ■ The male urogenital system.

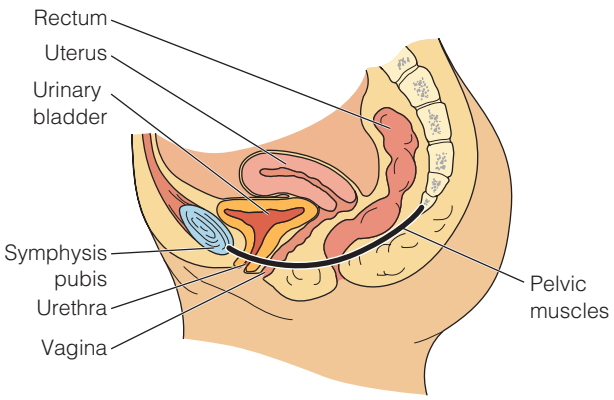


Figure 48–4 ■ The female urogenital system.

marked by the ureter openings at the posterior corners and the opening of the urethra at the anterior inferior corner (see Figure 48–1).

The bladder is capable of considerable distention because of rugae (folds) in the mucous membrane lining and because of the elasticity of its walls. When full, the dome of the bladder may extend above the symphysis pubis; in extreme situations, it may extend as high as the umbilicus. Normal bladder capacity is between 300 and 600 mL of urine.

Urethra

The urethra extends from the bladder to the urinary **meatus** (opening). In the adult woman, the urethra lies directly behind the symphysis pubis, anterior to the vagina, and is between 3 and 4 cm (1.5 in.) long (see Figure 48–4). The urethra serves only as a passageway for the elimination of urine. The urinary meatus is located between the labia minora, in front of the vagina and below the clitoris. The male urethra is approximately 20 cm (8 in.) long and serves as a passageway for semen as well as urine (see Figure 48–3). The meatus is located at the distal end of the penis.

In both men and women, the urethra has a mucous membrane lining that is continuous with the bladder and the ureters. Thus, an infection of the urethra can extend through the urinary tract to the kidneys. Women are particularly prone to urinary tract infections (UTIs) because of their short urethra and the proximity of the urinary meatus to the vagina and anus.

Pelvic Floor

The vagina, urethra, and rectum pass through the pelvic floor, which consists of sheets of muscles and ligaments that provide support to the viscera of the pelvis (see Figures 48–3 and 48–4). These muscles and ligaments extend from the symphysis pubis to the coccyx forming a sling. Specific sphincter muscles contribute to the continence mechanism (see the Anatomy & Physiology Review). The internal sphincter muscle situated in the proximal urethra and the bladder neck is composed of smooth muscle under *involuntary* control. It provides active tension designed to close the urethral lumen. The external sphincter muscle is composed of skeletal muscle under *voluntary* control, allowing the individual to choose when urine is eliminated.

Urination

Micturition, **voiding**, and **urination** all refer to the process of emptying the urinary bladder. Urine collects in the bladder until pressure stimulates special sensory nerve endings in the bladder wall called stretch receptors. This occurs when the adult bladder contains between 250 and 450 mL of urine. In children, a considerably smaller volume, 50 to 200 mL, stimulates these nerves.

The stretch receptors transmit impulses to the spinal cord, specifically to the voiding reflex center located at the level of the second to fourth sacral vertebrae, causing the internal sphincter to relax and stimulating the urge to void. If the time and place are appropriate for urination, the conscious portion of the brain relaxes the external urethral sphincter muscle and urination takes place. If the time and place are inappropriate, the micturition reflex usually subsides until the bladder becomes more filled and the reflex is stimulated again.

Voluntary control of urination is possible only if the nerves supplying the bladder and urethra, the neural tracts of the cord and brain, and the motor area of the cerebrum are all intact. The individual must be able to sense that the bladder is full. Injury to any of these parts of the nervous system—for example, by a cerebral hemorrhage or spinal cord injury above the level of the sacral region—results in intermittent involuntary emptying of the bladder. Older adults whose cognition is impaired may not be aware of the need to urinate or able to respond to this urge by seeking toilet facilities.

FACTORS AFFECTING VOIDING

Numerous factors affect the volume and characteristics of the urine produced and the manner in which it is excreted.

Developmental Factors

INFANTS

Urine output varies according to fluid intake but gradually increases to 250 to 500 mL a day during the first year. An infant may urinate as often as 20 times a day. The urine of the neonate is colorless and odorless and has a specific gravity of 1.008. Because newborns and infants have immature kidneys, they are unable to concentrate urine very effectively.

Infants are born without urinary control. Most will develop this between the ages of 2 and 5 years. Control during the daytime normally precedes night-time control.

PRESCHOOLERS

The preschooler is able to take responsibility for independent toileting. Parents need to realize that accidents do occur and the child should never be punished or disciplined for this. Children often forget to wash their hands or flush the toilet and need instruction in wiping themselves. Girls should be taught to wipe from front to back to prevent contamination of the urinary tract by feces.

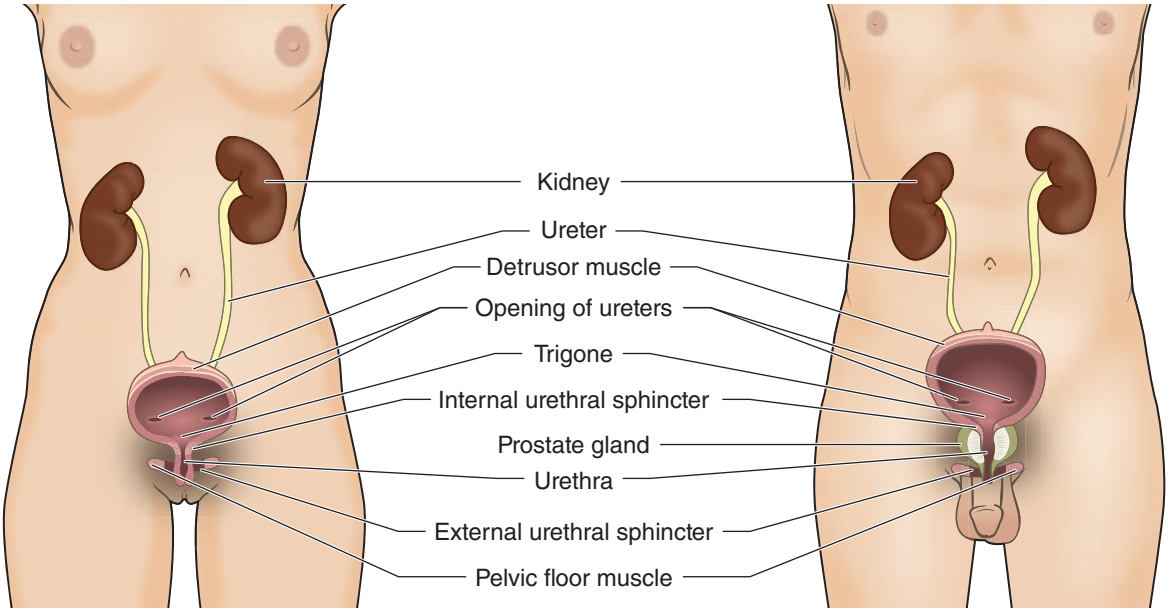
SCHOOL-AGE CHILDREN

The school-age child's elimination system reaches maturity during this period. The kidneys double in size between ages 5 and 10 years. During this period, the child urinates six to eight times a day. **Enuresis**, which is defined as the involuntary passing of urine

ANATOMY & PHYSIOLOGY REVIEW
Female and Male Urinary Bladders and Urethras

The pelvic floor muscles are under voluntary control and are important in controlling urination (continence). These muscles can become weakened by pregnancy and childbirth, chronic constipation, a decrease in estrogen (menopause), being overweight, aging, and lack of general fitness.

Review the figures and find the pelvic floor muscles.



QUESTIONS

1. Do you think pelvic floor muscles can be strengthened? Provide your rationale.
2. Explain how exercising the pelvic floor muscles helps to control urination.

See student resource website for answers.

when control should be established (about 5 years of age), can be a problem for some school-age children. About 10% of all 6-year-olds experience difficulty controlling the bladder. **Nocturnal enuresis**, or bed-wetting, is the involuntary passing of urine during sleep. It has many causes but basically it occurs because the client fails to awaken when the bladder empties. Bed-wetting should not be considered a problem until after the age of 6. Nocturnal enuresis may be referred to as primary when the child has never achieved nighttime urinary control. The incidence of nocturnal enuresis declines as the child matures. Secondary enuresis is that which appears after the child has achieved dryness for a period of 6 consecutive months. It is often related to another problem such as constipation, stress, or illness and may resolve when the cause is eliminated. Recent research indicates that primary and secondary nocturnal enuresis may both be related to poor daytime voiding habits, and children should be taught to be aware of the sensation to void (Norfolk & Wootton, 2012).

OLDER ADULTS

The excretory function of the kidney diminishes with age, but usually not significantly below normal levels unless a disease process intervenes. Blood flow can be reduced by arteriosclerosis, impairing renal function. With age, the number of functioning nephrons decreases to some degree, impairing the kidney's filtering abilities. Conditions that alter normal fluid intake and output, such as having influenza or having surgery, can compromise the kidney's ability to filter, maintain acid–base balance, and maintain electrolyte balance in older adults. It also takes a much longer time for these processes to return to normal functioning. The decrease in kidney function also places the older adult at higher risk for toxicity from medications if excretion rates are longer.

The more noticeable changes with age are those related to the bladder. Complaints of urinary urgency and urinary frequency are common. In men these changes are often due to an enlarged prostate gland, and in women they may be due to weakened muscles supporting the bladder or weakness of the urethral sphincter. The capacity of the bladder and its ability to completely empty diminish with age. This explains the need for older adults to arise during the night to void (**nocturnal frequency**) and the retention of residual urine, predisposing the older adult to bladder infections.

See Table 48–1 for a summary of the developmental changes affecting urinary output and the Lifespan Considerations feature.

Psychosocial Factors

For many people, a set of conditions helps stimulate the micturition reflex. These conditions include privacy, normal position, sufficient time, and, occasionally, running water. Circumstances that do not allow for the client's accustomed conditions may produce anxiety and muscle tension. As a result, the person is unable to relax abdominal and perineal muscles and the external urethral sphincter; thus, voiding is inhibited. People also may voluntarily suppress urination because of perceived time pressures; for example, nurses often ignore the urge to void until they are able to take a break. This behavior can increase the risk of UTIs.

Fluid and Food Intake

The healthy body maintains a balance between the amount of fluid ingested and the amount of fluid eliminated. When the amount of fluid intake increases, therefore, the output normally increases.

TABLE 48–1 Changes in Urinary Elimination Throughout the Life Span

Stage	Variations
Fetuses	The fetal kidney begins to excrete urine between the 11th and 12th week of development.
Infants	Ability to concentrate urine is minimal; therefore, urine appears light yellow.
	Because of neuromuscular immaturity, voluntary urinary control is absent.
Children	Kidney function reaches maturity between the first and second year of life; urine is concentrated effectively and appears a normal amber color.
	Between 18 and 24 months of age, the child starts to recognize bladder fullness and is able to hold urine beyond the urge to void.
	At approximately 2 1/2 to 3 years of age, the child can perceive bladder fullness, hold urine after the urge to void, and communicate the need to urinate.
	Full urinary control usually occurs at age 4 or 5 years; daytime control is usually achieved by age 3 years.
Adults	The kidneys reach maximum size between 35 and 40 years of age.
	After 50 years, the kidneys begin to diminish in size and function. Most shrinkage occurs in the cortex of the kidney as individual nephrons are lost.
Older Adults	An estimated 30% of nephrons are lost by age 80.
	Renal blood flow decreases because of vascular changes and a decrease in cardiac output.
	The ability to concentrate urine declines.
	Bladder muscle tone diminishes, causing increased frequency of urination and nocturia (awakening to urinate at night).
	Diminished bladder muscle tone and contractibility may lead to residual urine in the bladder after voiding, increasing the risk of bacterial growth and infection.
	Urinary incontinence may occur due to mobility problems or neurologic impairments.

LIFESPAN CONSIDERATIONS Factors Affecting Voiding

INFANTS AND CHILDREN

- Urinary tract infections (UTIs) are the second most common infection in children, after respiratory infections. They are seen more frequently in newborn and young infant boys than girls and are most often due to obstructions or malformations of the urinary system in these children (Ball, Bindler, & Cowen, 2012). In older infants and children, girls have more UTIs than boys, usually due to contamination of the urethra with stool.
- Teaching proper perineal hygiene can reduce infection. Girls should learn to wipe from front to back and wear cotton underwear.
- Teach children and parents that they should go to the bathroom as soon as the sensation to void is felt and not try to hold the urine in.

OLDER ADULTS

Many changes of aging cause specific problems in urinary elimination. Many conditions can be treated to lessen symptoms. Some of the following conditions are etiologic factors in problems with urinary elimination:

- Many older men have enlarged prostate glands, which can inhibit complete emptying of the bladder, resulting in urinary retention and urgency that can cause incontinence.
- After menopause women have decreased estrogen levels, which results in a decrease in perineal tone and support of bladder, vagina, and supporting tissues. This often results in urgency and stress incontinence and can even increase the incidence of UTIs.
- Increased stiffness and joint pain, previous joint surgery, and neuromuscular problems can impair mobility, making it difficult to get to the bathroom.
- Cognitive impairment, such as in dementia, often prevents the person from understanding the need to urinate and the actions needed to perform the activity.

Interventions that may improve these conditions include:

- Medications or surgery to relieve obstructions in men and strengthen support in the urogenital area in women.
- Behavioral training for better bladder control.
- Providing safe, easy access to the bathroom or bedside commode, whether at home or in an institution. Make sure the room is well lit, the environment is safe, and the proper assistive devices are within reach (such as walkers, canes).
- Habit training, such as taking the person to the bathroom at a regular, scheduled time. This can often work very well with people who have cognitive impairments.

Certain fluids, such as alcohol, increase fluid output by inhibiting the production of antidiuretic hormone. Fluids that contain caffeine (e.g., coffee, tea, and cola drinks) also increase urine production. By contrast, food and fluids high in sodium can cause fluid retention because water is retained to maintain the normal concentration of electrolytes.

Some foods and fluids can change the color of urine. For example, beets can cause urine to appear red; foods containing carotene can cause the urine to appear yellower than usual.

Medications

Many medications, particularly those affecting the autonomic nervous system, interfere with the normal urination process and may cause retention (Box 48–1). **Diuretics** (e.g., chlorothiazide and furosemide) increase urine formation by preventing the reabsorption of water and electrolytes from the tubules of the kidney into the bloodstream. Some medications may alter the color of the urine.

Muscle Tone

Good muscle tone is important to maintain the stretch and contractility of the detrusor muscle so the bladder can fill adequately and empty completely. Clients who require a retention catheter for a long period may have poor bladder muscle tone because continuous drainage of urine prevents the bladder from filling and emptying normally. Pelvic muscle tone also contributes to the ability to store and empty urine.

Pathologic Conditions

Some diseases and pathologies can affect the formation and excretion of urine. Diseases of the kidneys may affect the ability of the nephrons to produce urine. Abnormal amounts of protein or blood cells may be present in the urine, or the kidneys may virtually stop producing urine altogether, a condition known as renal failure. Heart and circulatory disorders such as heart failure, shock, or hypertension can affect blood flow to the kidneys, interfering with urine production. If abnormal amounts of fluid are lost through another route (e.g., vomiting or high fever), the kidneys retain water and urinary output falls.

Processes that interfere with the flow of urine from the kidneys to the urethra affect urinary excretion. A urinary stone (calculus) may obstruct a ureter, blocking urine flow from the kidney to the bladder. Hypertrophy of the prostate gland, a common condition affecting older men, may obstruct the urethra, impairing urination and bladder emptying.

BOX 48–1 Medications That May Cause Urinary Retention

- Anticholinergic medications, such as Atropine, Robinul, and Pro-Banthine
- Antidepressant and antipsychotic agents, such as tricyclic antidepressants and MAO inhibitors
- Antihistamine preparations, such as pseudoephedrine (Actifed and Sudafed)
- Antihypertensives, such as hydralazine (Apresoline) and methyldopa (Aldomet)
- Antiparkinsonism drugs, such as levodopa, trihexyphenidyl (Artane), and benztropine mesylate (Cogentin)
- Beta-adrenergic blockers, such as propranolol (Inderal)
- Opioids, such as hydrocodone (Vicodin)

Surgical and Diagnostic Procedures

Some surgical and diagnostic procedures affect the passage of urine and the urine itself. The urethra may swell following a cystoscopy, and surgical procedures on any part of the urinary tract may result in some postoperative bleeding; as a result, the urine may be red or pink tinged for a time.

Spinal anesthetics can affect the passage of urine because they decrease the client's awareness of the need to void. Surgery on structures adjacent to the urinary tract (e.g., the uterus) can also affect voiding because of swelling in the lower abdomen.

ALTERED URINE PRODUCTION

Although people's patterns of urination are highly individual, most people void about five to six times a day. People usually void when they first awaken in the morning, before they go to bed, and around mealtimes. Table 48–2 shows the average urinary output per day at different ages.

Polyuria

Polyuria (or **diuresis**) refers to the production of abnormally large amounts of urine by the kidneys, often several liters more than the client's usual daily output. Polyuria can follow excessive fluid intake, a condition known as **polydipsia**, or may be associated with diseases such as diabetes mellitus, diabetes insipidus, and chronic nephritis. Polyuria can cause excessive fluid loss, leading to intense thirst, dehydration, and weight loss.

Oliguria and Anuria

The terms *oliguria* and *anuria* are used to describe decreased urinary output. **Oliguria** is low urine output, usually less than 500 mL a day or 30 mL an hour for an adult. Although oliguria may occur because of abnormal fluid losses or a lack of fluid intake, it often indicates impaired blood flow to the kidneys or impending renal failure and should be promptly reported to the primary care provider.

TABLE 48–2 Average Daily Urine Output by Age

Age	Amount (ml)
1–2 days	15–60
3–10 days	100–300
10 days–2 months	250–450
2 months–1 year	400–500
1–3 years	500–600
3–5 years	600–700
5–8 years	700–1,000
8–14 years	800–1,400
14 years through adulthood	1,500
Older adulthood	1,500 or less

Restoring renal blood flow and urinary output promptly can prevent renal failure and its complications. **Anuria** refers to a lack of urine production.

Should the kidneys become unable to adequately function, some mechanism of filtering the blood is necessary to prevent illness and death. This filtering is done through the use of renal **dialysis**, a technique by which fluids and molecules pass through a semipermeable membrane according to the rules of osmosis. The two most common methods of dialysis are hemodialysis and peritoneal dialysis. In hemodialysis, the client's blood flows through vascular catheters, passes by the dialysis solution in an external machine, and then returns to the client. In peritoneal dialysis, the dialysis solution is instilled into the abdominal cavity through a catheter, allowed to rest there while the fluid and molecules exchange, and then removed through the catheter. Both hemodialysis and peritoneal dialysis must be performed at frequent intervals until the client's kidneys can resume the filtering function.

ALTERED URINARY ELIMINATION

Despite normal urine production, a number of factors or conditions can affect urinary elimination. Frequency, nocturia, urgency, and dysuria often are manifestations of underlying conditions such as a UTI. Enuresis, incontinence, retention, and neurogenic bladder may be either a manifestation or the primary problem affecting urinary elimination. Selected factors associated with altered patterns of urine elimination are identified in Table 48–3.

Frequency and Nocturia

Urinary frequency is voiding at frequent intervals, that is, more than four to six times per day. An increased intake of fluid causes some increase in the frequency of voiding. Conditions such as UTI, stress, and pregnancy can cause frequent voiding of small quantities (50 to 100 mL) of urine. Total fluid intake and output may be normal.

Nocturia is voiding two or more times at night. Like frequency, it is usually expressed in terms of the number of times the person gets out of bed to void, for example, "nocturia × 4."

Urgency

Urgency is the sudden, strong desire to void. There may or may not be a great deal of urine in the bladder, but the person feels a need to void immediately. Urgency accompanies psychological stress and irritation of the trigone and urethra. It is also common in people who have poor external sphincter control and unstable bladder contractions. It is not a normal finding.

TABLE 48–3 Selected Factors Associated with Altered Urinary Elimination

Pattern	Selected Associated Factors
Polyuria	Ingestion of fluids containing caffeine or alcohol Prescribed diuretic Presence of thirst, dehydration, and weight loss History of diabetes mellitus, diabetes insipidus, or kidney disease
Oliguria, anuria	Decrease in fluid intake Signs of dehydration Presence of hypotension, shock, or heart failure History of kidney disease Signs of renal failure such as elevated blood urea nitrogen (BUN) and serum creatinine, edema, hypertension
Frequency or nocturia	Pregnancy Increase in fluid intake UTI
Urgency	Presence of psychological stress UTI
Dysuria	Urinary tract inflammation, infection, or injury Hesitancy, hematuria, pyuria (pus in the urine), and frequency
Enuresis	Family history of enuresis Difficult access to toilet facilities Home stresses
Incontinence	Bladder inflammation, cerebrovascular accident (CVA; stroke), spinal cord injury, or other disease Difficulties in independent toileting (mobility impairment) Leakage when coughing, laughing, sneezing Cognitive impairment Retention Distended bladder on palpation and percussion Associated signs, such as pubic discomfort, restlessness, frequency, and small urine volume Recent anesthesia Recent perineal surgery Presence of perineal swelling Medications prescribed Lack of privacy or other factors inhibiting micturition

Dysuria

Dysuria means voiding that is either painful or difficult. It can accompany a stricture (decrease in caliber) of the urethra, urinary infections, and injury to the bladder and urethra. Often clients will say they have to push to void or that burning accompanies or follows voiding. The burning may be described as severe, like a hot poker, or more subdued, like a sunburn. Often, **urinary hesitancy** (a delay and difficulty in initiating voiding) is associated with dysuria.

Enuresis

Enuresis is involuntary urination in children beyond the age when voluntary bladder control is normally acquired, usually 4 or 5 years of age. Nocturnal enuresis often is irregular in occurrence and affects boys more often than girls. Diurnal (daytime) enuresis may be persistent and pathologic in origin. It affects women and girls more frequently.

Urinary Incontinence

Urinary incontinence (UI), or involuntary leakage of urine or loss of bladder control, is a health symptom, not a disease. It is only normal in infants. It has been estimated that 20 million women and 6 million men experience some type of UI in their lifetime (Scemons, 2013, p. 53). Shultz (2012) found that 30% of homebound older adults are incontinent, and UI contributed significantly to their being homebound. More than half of all residents in long-term care (LTC) facilities are incontinent and UI is the second leading cause of institutionalization (p. 32). In spite of the high numbers of adults with UI, it is underreported and undertreated, and can lead to a decreased qualify of life (Keyock & Newman, 2011).

Direct and indirect costs are associated with UI. The annual cost of around $20 billion for incontinence is higher than for chronic diseases such as arthritis (Scemons, 2013). The majority of direct cost is spent on routine care including pads, diapers, and laundry related to frequent clothing changes. Other costs include medications and surgical treatment. Indirect costs relate to quality-of-life issues and psychosocial consequences. Studies have shown that incontinent women have an increased incidence of social isolation, social withdrawal, less positive relationships with others, poorer perceived health, negative effect on sexual function and intimacy, increased incidence of depression, and a barrier to social interest, physical activity, and other everyday activities (Schultz, 2012).

The four main types of UI are stress urinary incontinence, urge urinary incontinence, mixed urinary incontinence, and overflow incontinence.

STRESS URINARY INCONTINENCE

Stress urinary incontinence (SUI) occurs because of weak pelvic floor muscles and/or urethral hypermobility, causing urine leakage with such activities as laughing, coughing, sneezing, or any body movement that puts pressure on the bladder. Facts that make women more likely to experience SUI include shorter urethras, the trauma to the pelvic floor associated with childbirth, and changes related to menopause. For men, SUI may result after a prostatectomy. Keyock and Newman (2011) stress the importance of clients understanding that SUI is not related to emotional stress but is "caused by increased pressure or 'stress' on the bladder as well as anatomical changes to the urethra, and pelvic floor muscle weakness" (p. 26).

URGE URINARY INCONTINENCE

This type of incontinence is described as an urgent need to void and the inability to stop micturition (passage of urine). The urine leakage can range from a few drops to soaking of undergarments. Urge incontinence is a major symptom of an overactive bladder (National Association for Continence [NAFC], 2014).

MIXED URINARY INCONTINENCE

Mixed incontinence is diagnosed when symptoms of both stress UI and urgency UI are present. It is very common among middle-age and older women (Scemons, 2013). Treatment is usually based on which type of UI is the most bothersome to the client.

OVERFLOW INCONTINENCE

This is "continuous involuntary leakage or dribbling of urine that occurs with incomplete bladder emptying" (Scemons, 2013, p. 55). It can be seen in men with an enlarged prostate and clients with a neurologic disorder (e.g., multiple sclerosis, Parkinson's disease, spinal cord injury). An impaired neurologic function can interfere with the normal mechanisms of urine elimination, resulting in a **neurogenic bladder**. The client with a neurogenic bladder does not perceive bladder fullness and is therefore unable to control the urinary sphincters. The bladder may become flaccid and distended or spastic, with frequent involuntary urination.

Urinary Retention

When emptying of the bladder is impaired, urine accumulates and the bladder becomes overdistended, a condition known as **urinary retention**. Overdistention of the bladder causes poor contractility of the detrusor muscle, further impairing urination. Common causes of urinary retention include prostatic hypertrophy (enlargement), surgery, and some medications (see Box 48–1). Acute urinary retention is the most common complication in the first 2 to 4 hours postoperatively (Palese, Buchini, Deroma, & Barbone, 2010). Causes of chronic urinary retention can include paraplegia, quadriplegia, multiple sclerosis, and urethral or perineal trauma (Bullman, 2011, p. 259).

Clients with urinary retention may experience overflow incontinence, eliminating 25 to 50 mL of urine at frequent intervals. The bladder is firm and distended on palpation and may be displaced to one side of the midline.

●○● NURSING MANAGEMENT

Assessing

A complete assessment of a client's urinary function includes the following:

- Nursing history
- Physical assessment of the genitourinary system, hydration status, and examination of the urine
- Relating the data obtained to the results of any diagnostic tests and procedures.

Nursing History

The nurse determines the client's normal voiding pattern and frequency, appearance of the urine and any recent changes, any past or current problems with urination, the presence of an ostomy, and factors influencing the elimination pattern.

Examples of interview questions to elicit this information are shown in the Assessment Interview. The number of questions asked depends on the individual and the responses to the first three categories.

Physical Assessment

Complete physical assessment of the urinary tract usually includes percussion of the kidneys to detect areas of tenderness. Palpation and percussion of the bladder are also performed. If the client's history or current problems indicate a need for it, the urethral meatus of both male and female clients is inspected for swelling, discharge, and inflammation.

Because problems with urination can affect the elimination of wastes from the body, it is important for the nurse to assess the skin for color, texture, and tissue turgor as well as the presence of edema. If incontinence, dribbling, or dysuria is noted in the history, the skin of the perineum should be inspected for irritation because contact with urine can excoriate the skin.

Assessing Urine

Normal urine consists of 96% water and 4% solutes. Organic solutes include urea, ammonia, creatinine, and uric acid. Urea is the chief organic solute. Inorganic solutes include sodium, chloride, potassium, sulfate, magnesium, and phosphorus. Sodium chloride is the most abundant inorganic salt. Variations in color can occur. Characteristics of normal and abnormal urine are shown in Table 48–4.

Measuring Urinary Output

Normally, the kidneys produce urine at a rate of approximately 60 mL/h or about 1,500 mL/day. Urine output is affected by many factors, including fluid intake, body fluid losses through other routes such as perspiration and breathing or diarrhea, and the cardiovascular and renal status of the individual.

Urine outputs below 30 mL/h may indicate low blood volume or kidney malfunction and must be reported. To measure fluid output the nurse follows these steps:

- Wear clean gloves to prevent contact with microorganisms or blood in urine.
- Ask the client to void in a clean urinal, bedpan, commode, or toilet collection device ("hat") (Figure 48–5 ■).
- Instruct the client to keep urine separate from feces and to avoid putting toilet paper in the urine collection container.
- Pour the voided urine into a calibrated container.
- Hold the container at eye level, read the amount in the container. Containers usually have a measuring scale on the inside.
- Record the amount on the fluid intake and output sheet, which may be at the bedside or in the bathroom.
- Rinse the urine collection and measuring containers with cool water and store appropriately.
- Remove gloves and perform hand hygiene.
- Calculate and document the total output at the end of each shift and at the end of 24 h on the client's chart.

Many clients can measure and record their own urine output when the procedure is explained to them.

When measuring urine from a client who has a urinary catheter, the nurse follows these steps:

- Apply clean gloves.
- Take the calibrated container to the bedside.
- Place the container under the urine collection bag so that the spout of the bag is above the container but not touching it. The calibrated container is not sterile, but the inside of the collection bag is sterile (Figure 48–6 ■).
- Open the spout and permit the urine to flow into the container.
- Close the spout, then proceed as described in the previous list.

ASSESSMENT INTERVIEW Urinary Elimination

VOIDING PATTERN

- How many times do you urinate during a 24-hour period?
- Has this pattern changed recently?
- Do you need to get out of bed to void at night? How often?

DESCRIPTION OF URINE AND ANY CHANGES

- How would you describe your urine in terms of color, clarity (clear, transparent, or cloudy), and odor (faint or strong)?

URINARY ELIMINATION PROBLEMS

- What problems have you had or do you now have with passing your urine?
- Passage of small amounts of urine?
- Voiding at more frequent intervals?
- Trouble getting to the bathroom in time, or feeling an urgent need to void?
- Painful voiding?
- Difficulty starting urine stream?
- Frequent dribbling of urine or feeling of bladder fullness associated with voiding small amounts of urine?
- Reduced force of stream?
- Accidental leakage of urine? If so, when does this occur (e.g., when coughing, laughing, or sneezing; at night; during the day)?
- Past urinary tract illness such as infection of the kidney, bladder, or urethra? History of renal, ureteral, or bladder surgery?

FACTORS INFLUENCING URINARY ELIMINATION

- *Medications.* What medications are you taking? Do you know if any of your medications increase urinary output or cause retention of urine? Note specific medication and dosage.
- *Fluid intake.* How much and what kind of fluid do you drink each day (e.g., six glasses of water, two cups of coffee, three cola drinks with or without caffeine)?
- *Environmental factors.* Do you have any problems with toileting (mobility, removing clothing, toilet seat too low, facility without grab bar)?
- *Stress.* Are you experiencing any major stress? If so, what are the stressors? Do you think these affect your urinary pattern?
- *Disease.* Have you had or do you have any illnesses that may affect urinary function, such as hypertension, heart disease, neurologic disease, cancer, prostatic enlargement, or diabetes?
- *Diagnostic procedures and surgery.* Have you recently had a cystoscopy or anesthetic?

TABLE 48–4 Characteristics of Normal and Abnormal Urine

Characteristic	Normal	Abnormal	Nursing Considerations
Amount in 24 hours (adult)	1,200–1,500 mL	Under 1,200 mL A large amount over intake	Urinary output normally is approximately equal to fluid intake. Output of less than 30 mL/h may indicate decreased blood flow to the kidneys and should be immediately reported.
Color, clarity	Straw, amber Transparent	Dark amber Cloudy Dark orange Red or dark brown Mucous plugs, viscid, thick	Concentrated urine is darker in color. Dilute urine may appear almost clear, or very pale yellow. Some foods and drugs may color urine. Red blood cells in the urine (hematuria) may be evident as pink, bright red, or rusty brown urine. Menstrual bleeding can also color urine but should not be confused with hematuria. White blood cells, bacteria, pus, or contaminants such as prostatic fluid, sperm, or vaginal drainage may cause cloudy urine.
Odor	Faint aromatic	Offensive	Some foods (e.g., asparagus) cause a musty odor; infected urine can have a fetid odor; urine high in glucose has a sweet odor.
Sterility	No microorganisms present	Microorganisms present	Urine in the bladder is sterile. Urine specimens, however, may be contaminated by bacteria from the perineum during collection.
pH	4.5–8	Over 8 Under 4.5	Freshly voided urine is normally somewhat acidic. Alkaline urine may indicate a state of alkalosis, UTI, or a diet high in fruits and vegetables. More acidic urine (low pH) is found in starvation, with diarrhea, or with a diet high in protein foods or cranberries.
Specific gravity	1.010–1.025	Over 1.025 Under 1.010	Concentrated urine has a higher specific gravity; diluted urine has a lower specific gravity.
Glucose	Not present	Present	Glucose in the urine indicates high blood glucose levels (greater than 180 mg/dL) and may be indicative of undiagnosed or uncontrolled diabetes mellitus.
Ketone bodies (acetone)	Not present	Present	Ketones, the end product of the breakdown of fatty acids, are not normally present in urine. They may be present in the urine of clients who have uncontrolled diabetes mellitus, who are in a state of starvation, or who have ingested excessive amounts of aspirin.
Blood	Not present	Occult (microscopic) Bright red	Blood may be present in the urine of clients who have UTI, kidney disease, or bleeding from the urinary tract.

Figure 48–5 ■ A urine "hat"—a urine collection device for the toilet.

Figure 48–6 ■ Urine being measured from a urine collection bag.

Measuring Residual Urine

Postvoid residual (PVR) (urine remaining in the bladder following voiding) is normally 50 to 100 mL. However, a bladder outlet obstruction (e.g., enlargement of the prostate gland) or loss of bladder muscle tone may interfere with complete emptying of the bladder during urination. Manifestations of urine retention may include frequent voiding of small amounts (e.g., less than 100 mL in an adult), urinary stasis, and UTI. PVR is measured to assess the amount of retained urine after voiding and determine the need for interventions (e.g., medications to promote detrusor muscle contraction).

To measure PVR, the nurse catheterizes or bladder scans the client after voiding (Figure 48–7 ■). The amount of urine voided and the amount obtained by catheterization or bladder scan are measured and recorded. An indwelling catheter may be inserted if the PVR exceeds a specified amount.

Diagnostic Tests

Blood levels of two metabolically produced substances, urea and creatinine, are routinely used to evaluate renal function. The kidneys through filtration and tubular secretion normally eliminate both urea and creatinine. Urea, the end product of protein metabolism, is measured as **blood urea nitrogen (BUN)**. Creatinine is produced in relatively constant quantities by the muscles. The **creatinine clearance** test uses 24-hour urine and serum creatinine levels to determine the glomerular filtration rate, a sensitive indicator of renal function. Other tests related to urinary functions such as collecting urine specimens, measuring specific gravity, and visualization procedures are described in Chapter 34 ∞.

Figure 48–7 ■ A handheld, portable ultrasound device can measure bladder urine volume noninvasively.

Diagnosing

NANDA International (Herdman & Kamitsuru, 2014) includes two general diagnostic labels for urinary elimination:

- ***Impaired Urinary Elimination:*** dysfunction in urine elimination
- ***Readiness for Enhanced Urinary Elimination:*** a pattern of urinary functions for meeting eliminatory needs, which can be strengthened.

It is suggested that a more specific diagnostic label be used when possible. The more specific NANDA International nursing diagnoses related to urinary elimination include the following:

- *Functional Urinary Incontinence*
- *Overflow Urinary Incontinence*
- *Reflex Urinary Incontinence*
- *Stress Urinary Incontinence*
- *Urge Urinary Incontinence*
- *Risk for Urge Urinary Incontinence*
- *Urinary Retention*

See Box 48–2 for definitions of NANDA diagnoses related to incontinence.

Clinical examples of assessment data clusters and related nursing diagnoses, outcomes, and interventions are shown in the Nursing Care Plan and Concept Map at the end of this chapter.

Evidence-Based Practice What Is the Effectiveness of the Ultrasound Bladder Scanner in Reducing Urinary Tract Infections?

EVIDENCE-BASED PRACTICE

Urinary retention, a common complication postoperatively, can lead to complications, client discomfort, and a longer hospitalization stay. Two ways to detect and monitor urinary retention are with an ultrasound bladder scanner or with intermittent catheterization. Catheterization is an invasive procedure and increases the risk of UTI. On the other hand, the bladder scanner is noninvasive and permits evaluation of the bladder volume so that catheterization is only performed when the volume is over a designated amount. Palese and colleagues (2010) believed that there was a need to analyze the available research comparing the use of the bladder scanner followed by the decision to catheterize or not catheterize versus the clinical judgment of the nurse who decides whether to catheterize or not catheterize the client and the effect of these procedures in reducing catheter-associated UTIs (CAUTIs). A meta-analysis study was conducted to synthesize the evidence available in the literature on the effectiveness of the ultrasound bladder scanner in reducing the risk of UTI. The criteria for studies to be included in the research included the following: type of subject (hospitalized male and female subjects age 18 or over whose treatment required a need to evaluate bladder urinary volume); type of intervention (use of bladder scanner versus the clinical judgment of the nurses in evaluation of acute urinary retention followed by a decision whether or not to catheterize the client); and type of outcome (occurrence of at least one CAUTI before release from the hospital).

A total of 61 articles were found and 58 were excluded based on the criteria. The three studies that remained had some variation; for example, subjects in one study were neurosurgical and those in the other two studies were orthopedic; each study used a different type of scanner; evaluations were performed at 8 hours or 4 to 6 hours after surgery or the period was not indicated in one study; and the cutoff amount of when to catheterize varied from less than 499 mL to less than 800 mL. In spite of these variations, based on the statistical analyses, the studies were considered homogeneous. The researchers stated that the "use of bladder ultrasound reduced the risk of CAUTI by some 73%" (p. 2976).

IMPLICATIONS

A limitation of this study was the small number of appropriate studies included in the meta-analysis. Nevertheless, the use of the bladder scanner as a noninvasive assessment tool should become a common practice of nurses who provide care to surgical clients who develop acute urinary retention.

BOX 48–2 Definitions of NANDA International Incontinence Diagnoses

- *Functional Urinary Incontinence*—inability of usually continent person to reach toilet in time to avoid unintentional loss of urine
- *Overflow Urinary Incontinence*—involuntary loss of urine associated with overdistention of the bladder
- *Reflex Urinary Incontinence*—involuntary loss of urine at somewhat predictable intervals when a specific bladder volume is reached
- *Stress Urinary Incontinence*—sudden leakage of urine with activities that increase intra-abdominal pressure
- *Urge Urinary Incontinence*—involuntary passage of urine occurring soon after a strong sense of urgency to void
- *Risk for Urge Urinary Incontinence*—vulnerable to involuntary passage of urine occurring soon after a strong sensation or urgency to void, which may compromise health

From *NANDA International Nursing Diagnoses: Definitions and Classification, 2015–2017*, by T. H. Herdman and S. Kamitsuru (Eds.), 2014, Oxford, United Kingdom: Wiley-Blackwell.

Problems of urinary elimination also may become the etiology for other problems experienced by the client. Examples include the following:

- ***Risk for Infection*** if the client has urinary retention or undergoes an invasive procedure such as catheterization or cystoscopic examination.
- ***Situational Low Self-Esteem*** or ***Social Isolation*** if the client is incontinent. Incontinence can be physically and emotionally distressing to clients because it is considered socially unacceptable. Often the client is embarrassed about dribbling or having an accident and may restrict normal activities for this reason.
- ***Risk for Impaired Skin Integrity*** if the client is incontinent. Bed linens and clothes saturated with urine irritate and macerate the skin. Prolonged skin dampness leads to dermatitis (inflammation of the skin) and subsequent formation of dermal ulcers.
- ***Toileting Self-Care Deficit*** if the client has functional incontinence.
- ***Risk for Deficient Fluid Volume*** or ***Excess Fluid Volume*** if the client has impaired urinary function associated with a disease process.
- ***Disturbed Body Image*** if the client has a urinary diversion ostomy.
- ***Deficient Knowledge*** if the client requires self-care skills to manage (e.g., a new urinary diversion ostomy).
- ***Risk for Caregiver Role Strain*** if the client is incontinent and being cared for by a family member for extended periods.
- ***Risk for Social Isolation*** if the client is incontinent.

Planning

The goals established will vary according to the diagnosis and defining characteristics. Examples of overall goals for clients with urinary elimination problems may include the following:

- Maintain or restore a normal voiding pattern.
- Regain normal urine output.
- Prevent associated risks such as infection, skin breakdown, fluid and electrolyte imbalance, and lowered self-esteem.
- Perform toileting activities independently with or without assistive devices.
- Contain urine with the appropriate device, catheter, ostomy appliance, or absorbent product.

Appropriate preventive and corrective nursing interventions that relate to these must be identified. Specific nursing activities associated with each of these interventions can be selected to meet the client's individual needs. Examples of clinical applications of these using NANDA, NIC, and NOC designations are shown in the Nursing Care Plan and Concept Map at the end of the chapter.

Planning for Home Care

To provide for continuity of care, the nurse needs to consider the client's needs for teaching and assistance with care in the home. Discharge planning includes assessment of the client and family's resources and abilities for self-care, available financial resources, and the need for referrals and home health services. Home Care Assessment outlines an assessment of home care capabilities related to urinary elimination problems and needs. Client Teaching addresses the learning needs of the client and family.

DRUG CAPSULE

Anticholinergic Agent oxybutynin ER (Ditropan XL)

THE CLIENT WITH MEDICATIONS FOR URGE URINARY INCONTINENCE

Anticholinergic agents reduce urgency and frequency by blocking muscarinic receptors in the detrusor muscle of the bladder, thereby inhibiting contractions and increasing storage capacity. They are useful in relieving symptoms associated with voiding problems in clients with neurogenic bladder and reflex neurogenic bladder, and urge UI.

NURSING RESPONSIBILITIES

- Monitor for constipation, dry mouth, urinary retention, blurred vision, and mental confusion in older adults; symptoms may be dose related.
- Keep primary care provider informed of expected responses to therapy (e.g., effect on urinary frequency, urge incontinence, nocturia, and bladder emptying).
- Start with small doses in clients over the age of 75.
- Try using intermittently.
- Oxybutynin is contraindicated in clients with urinary retention, gastrointestinal motility problems (partial or complete GI obstruction, paralytic ileus), or uncontrolled narrow-angle glaucoma.

CLIENT AND FAMILY TEACHING

- Explain the reason for taking oxybutynin.
- Explain the side effects and the importance of reporting them to the health care provider.
- Exercise caution in hot environments. By suppressing sweating, oxybutynin can cause fever and heat stroke.
- Provide strategies for managing dry mouth.
- Instruct and advise regarding behavioral therapies for urge suppression.

Note: Prior to administering any medication, review all aspects with a current drug handbook or other reliable source.

Home Care Assessment Urinary Elimination PATIENT-CENTERED CARE

CLIENT AND ENVIRONMENT

- *Self-care abilities:* ability to consume adequate fluids, to perceive bladder fullness, to ambulate and get to the toilet, to manipulate clothing for toileting, and to perform hygiene measures after toileting
- *Current level of knowledge:* fluid and dietary intake modifications to promote normal patterns of urinary elimination, bladder training methods, and specific techniques to promote voiding care for indwelling catheter or ostomy (if appropriate)
- *Assistive devices required:* ambulatory aids such as walker, cane, or wheelchair; safety devices such as grab bars; toileting aids such as raised toilet seat, urinal, commode, or bedpan; presence of a urinary catheter
- *Physical layout of the toileting facilities:* presence of mobility aids; toilet at correct height to enable older clients to get up after voiding
- *Home environment factors that interfere with toileting:* distance to the bathroom from living areas or bedrooms; barriers such as stairways, scatter rugs, clutter, or narrow doorways that interfere with bathroom access; lighting (including night lighting)
- *Urinary elimination problems:* type of incontinence and precipitating factors; manifestations of UTI such as dysuria, frequency, urgency; evidence of prostatic hypertrophy and effect on urination; ability to perform self-catheterization and care for other urinary elimination devices such as indwelling catheter, urinary diversion ostomy, or condom drainage

FAMILY

- *Caregiver availability, skills, and responses:* ability and willingness to assume responsibilities for care, including assisting with toileting, intermittent catheterization, indwelling catheter care, urinary drainage devices or ostomy care; ready access to laundry facilities; access to and willingness to use respite or relief caregivers
- *Family role changes and coping:* effect on spousal and family roles, sleep/rest patterns, sexuality, and social interactions
- *Financial resources:* ability to purchase protective pads and garments, supplies for catheterization or ostomy care

COMMUNITY

- *Environment:* access to public restrooms and sanitary facilities
- *Current knowledge of and experience with community resources:* medical and assistive equipment and supply companies, home health agencies, local pharmacies, available financial assistance, support and educational organizations

Implementing

Maintaining Normal Urinary Elimination

Most interventions to maintain normal urinary elimination are independent nursing functions. These include promoting adequate fluid intake, maintaining normal voiding habits, and assisting with toileting.

Promoting Fluid Intake

Increasing fluid intake increases urine production, which in turn stimulates the micturition reflex. A normal daily intake averaging 1,500 mL of measurable fluids is adequate for most adult clients.

Many clients have increased fluid requirements, necessitating a higher daily fluid intake. For example, clients who are perspiring excessively (have diaphoresis) or who are experiencing abnormal fluid losses through vomiting, gastric suction, diarrhea, or wound drainage require fluid to replace these losses in addition to their normal daily intake requirements.

Clients who are at risk for UTI or urinary calculi (stones) should consume 2,000 to 3,000 mL of fluid daily. Dilute urine and frequent urination reduce the risk of UTI as well as stone formation.

Increased fluid intake may be contraindicated for some clients such as people with kidney failure or heart failure. For these clients, a fluid restriction may be necessary to prevent fluid overload and edema.

Maintaining Normal Voiding Habits

Prescribed medical therapies often interfere with a client's normal voiding habits. When a client's urinary elimination pattern is adequate, the nurse helps the client adhere to normal voiding habits as much as possible (see Practice Guidelines).

Assisting with Toileting

Clients who are weakened by a disease process or impaired physically may require assistance with toileting. The nurse should assist these clients to the bathroom and remain with them if they are at risk for falling. The bathroom should contain an easily accessible call signal to summon help if needed. Clients also need to be encouraged to use handrails placed near the toilet.

For clients unable to use bathroom facilities, the nurse provides urinary equipment close to the bedside (e.g., urinal, bedpan, commode) and provides the necessary assistance to use them.

Preventing Urinary Tract Infections

The rate of UTI is greater in women than men because of the short urethra and its proximity to the anal and vaginal areas. Most UTIs are caused by bacteria common to the intestinal environment (e.g., *Escherichia coli*). These gastrointestinal bacteria can colonize the perineal area and move into the urethra, especially when there is urethral trauma, irritation, or manipulation.

For women who have experienced a UTI, nurses need to provide instructions about ways to prevent a recurrence. The following guidelines are useful for anyone:

- Drink eight 8-ounce glasses of water per day to flush bacteria out of the urinary system.
- Practice frequent voiding (every 2 to 4 hours) to flush bacteria out of the urethra and prevent organisms from ascending into the bladder. Void immediately after intercourse.
- Avoid use of harsh soaps, bubble bath, powder, or sprays in the perineal area. These substances can be irritating to the urethra and encourage inflammation and bacterial infection.
- Avoid tight-fitting pants or other clothing that creates irritation to the urethra and prevents ventilation of the perineal area.
- Wear cotton rather than nylon underclothes. Accumulation of perineal moisture facilitates bacterial growth. Cotton enhances ventilation of the perineal area.
- Girls and women should always wipe the perineal area from front to back following urination or defecation in order to prevent introduction of gastrointestinal bacteria into the urethra.
- If recurrent urinary infections are a problem, take showers rather than baths. Bacteria present in bath water can readily enter the urethra.

CLIENT TEACHING

Urinary Elimination in the Home Setting

FACILITATING URINARY ELIMINATION SELF-CARE

- Teach the client and family to maintain easy access to toilet facilities, including removing scatter rugs and ensuring that halls and doorways are free of clutter.
- Suggest graduated lighting for night-time voiding: a dim night-light in the bedroom and low-wattage hallway lighting.
- Advise the client and family to install grab bars and elevated toilet seats as needed.
- Provide for instruction in safe transfer techniques. Contact physical therapy to provide training as needed.
- Suggest clothing that is easily removed for toileting, such as elastic waist pants or Velcro closures.

PROMOTING URINARY ELIMINATION

- Instruct the client to respond to the urge to void as soon as possible; avoid voluntary urinary retention.
- Teach the client to empty the bladder completely at each voiding.
- Emphasize the importance of drinking eight to ten 8-ounce glasses of water daily.
- Teach female clients about pelvic muscle exercises to strengthen perineal muscles.
- Inform the client about the relationship between tobacco use and bladder cancer and provide information about smoking cessation programs as indicated.
- Teach the client to promptly report any of the following to the primary care provider: pain or burning on urination, changes in urine color or clarity, malodorous urine, or changes in voiding patterns (e.g., nocturia, frequency, dribbling).

ASEPSIS

- Teach the client to maintain perineal-genital cleanliness, washing with soap and water daily and cleansing the anal and perineal area after defecating.
- Instruct female clients to wipe from front to back (from the urinary meatus toward the anus) after voiding, and to discard toilet paper after each swipe.
- Provide information about products to protect the skin, clothing, and furniture for clients who are incontinent. Emphasize the importance of cleaning and drying the perineal area after incontinence episodes. Instruct in the use of protective skin barrier products as needed.
- Teach clients with an indwelling catheter and their family about care measures such as cleaning the urinary meatus, managing and emptying the collection device, maintaining a closed system, and bladder irrigation or flushing if ordered.
- For clients with a urinary diversion, teach about care of the stoma, drainage devices, and surrounding skin. For continent diversions, teach the client how to catheterize the stoma to drain urine.
- For clients with an indwelling catheter or urinary diversion, emphasize the importance of maintaining a generous fluid intake (2.5 to 3 quarts daily) and of promptly reporting changes in urinary output, signs of urinary retention such as abdominal pain, and manifestations of UTI such as malodorous urine, abdominal discomfort, fever, or confusion.

MEDICATIONS

- Emphasize the importance of taking medications as prescribed. Instruct the client to take the full course of antibiotics ordered to treat a UTI, even though symptoms are relieved.
- Inform the client and family about any expected changes in urine color or odor associated with prescribed medications.
- For clients with urinary retention, emphasize the need to contact the primary care provider before taking any medication (even over-the-counter medications such as antihistamines) that may exacerbate symptoms.
- For clients taking medications that may damage the kidneys (e.g., aminoglycoside antibiotics), stress the importance of maintaining a generous fluid intake while taking the medication.
- Suggest measures to reduce anticipated side effects of prescribed medications, such as increasing intake of potassium-rich foods when taking a potassium-depleting diuretic such as furosemide.

DIETARY ALTERATIONS

- Teach the client about dietary changes to promote urinary function, such as consuming cranberry juice and foods that acidify the urine to reduce the risk of repeated UTIs or forming calcium-based urinary stones. See the *Dietary Measures* section on page 1198.
- Instruct clients with stress or urge incontinence to limit their intake of caffeine, alcohol, citrus juices, and artificial sweeteners because these are bladder irritants that may increase incontinence. Also, teach clients to limit their evening fluid intake to reduce the risk of night-time incontinence episodes.

MEASURES SPECIFIC TO URINARY PROBLEMS

- Provide instructions for clients with specific urinary problems or treatments such as these:
  a. Timed urine specimens (see Chapter 34 ∞)
  b. Urinary incontinence
  c. Urinary retention
  d. Retention catheters.

REFERRALS

- Make appropriate referrals to home health agencies, community agencies, or social services for assistance with resources such as installing grab bars and raised toilet seats; providing wheelchair access to bathrooms; obtaining toileting aids such as commodes, urinals, or bedpans; and services such as home health aides for assistance with activities of daily living.

COMMUNITY AGENCIES AND OTHER RESOURCES

- Provide information about resources for durable medical equipment such as commodes or raised toilet seats, possible financial assistance, and medical supplies such as drainage bags, incontinence briefs, or protective pads.
- Suggest additional sources of information and help such as the National Council of Independent Living, United Ostomy Association, National Association for Continence, and Simon Foundation for Continence.

Managing Urinary Incontinence

It is important to remember that UI is *not* a normal part of aging and often is treatable. The preliminary assessment and identification of the symptoms of UI are truly within the scope of nursing practice. All clients should be asked about their voiding patterns. Older adults who are incontinent while in their home or who manage to contain or conceal their incontinence from others do not consider themselves incontinent. Therefore, if asked if they are incontinent, they may deny it. However, asking if they lose urine when they cough, sneeze, or laugh or if they need to use some type of incontinence product may provide more accurate information (Keyock & Newman, 2011). Independent nursing interventions for clients with UI include (a) a behavior-oriented continence training program that may consist of bladder retraining, habit training, and pelvic floor muscle exercises,

PRACTICE GUIDELINES

Maintaining Normal Voiding Habits

POSITIONING

- Assist the client to a normal position for voiding: standing for male clients; for female clients, squatting or leaning slightly forward when sitting. These positions enhance movement of urine through the tract by gravity.
- If the client is unable to ambulate to the lavatory, use a bedside commode for females and a urinal for males standing at the bedside.
- If necessary, encourage the client to push over the pubic area with the hands or to lean forward to increase intra-abdominal pressure and external pressure on the bladder.

RELAXATION

- Provide privacy for the client. Many people cannot void in the presence of another person.
- Allow the client sufficient time to void.
- Suggest the client read or listen to music.
- Provide sensory stimuli that may help the client relax. Pour warm water over the perineum of a female or have the client sit in a warm bath to promote muscle relaxation. Applying a hot water bottle to the lower abdomen of both men and women may also foster muscle relaxation.
- Turn on running water within hearing distance of the client to stimulate the voiding reflex and to mask the sound of voiding for people who find this embarrassing.
- Provide ordered analgesics and emotional support to relieve physical and emotional discomfort to decrease muscle tension.

TIMING

- Assist clients who have the urge to void immediately. Delays only increase the difficulty in starting to void, and the desire to void may pass.
- Offer toileting assistance to the client at usual times of voiding, for example, on awakening, before or after meals, and at bedtime.

FOR CLIENTS WHO ARE CONFINED TO BED

- Warm the bedpan. A cold bedpan may prompt contraction of the perineal muscles and inhibit voiding.
- Elevate the head of the client's bed to Fowler's position, place a small pillow or rolled towel at the small of the back to increase physical support and comfort, and have the client flex the hips and knees. This position simulates the normal voiding position as closely as possible.

(b) meticulous skin care; and (c) for males, application of an external drainage device (condom-type catheter device).

CLINICAL ALERT!

If the client has any type of incontinence, recommend the use of incontinence pads because they are designed to absorb urine as opposed to feminine hygiene pads.

Continence (Bladder) Retraining

A continence retraining program requires the involvement of the nurse, the client, and support people. Clients must be alert and physically able to participate in the training protocol. A bladder retraining program may include the following:

- Education of the client and support people.
- **Bladder retraining**, which requires that the client postpone voiding, resist or inhibit the sensation of urgency, and void according to a timetable rather than according to the urge to void. The goals are to gradually lengthen the intervals between urination to correct the client's frequent urination, to stabilize the bladder, and to diminish urgency. This form of training may be used for clients who have bladder instability and urge incontinence. Delayed voiding provides larger voided volumes and longer intervals between voiding. Initially, voiding may be encouraged every 2 to 3 hours except during sleep and then every 4 to 6 hours. A vital component of bladder training is inhibiting the urge-to-void sensation. To do this, the nurse instructs the client to practice deep, slow breathing until the urge diminishes or disappears. This is performed every time the client has a premature urge to void. See Practice Guidelines.
- **Habit training**, also referred to as scheduled toileting, attempts to keep clients dry by having them void at regular intervals, such as every 2 to 4 hours. The goal is to keep the client dry and is a common therapy for frail older clients and those who are bedridden or have Alzheimer's disease (NAFC, 2013).

PRACTICE GUIDELINES

Bladder Retraining

- Determine the client's voiding pattern and encourage voiding at those times, or establish a regular voiding schedule and help the client to maintain it, whether the client feels the urge or not (e.g., on awakening, every 1 or 2 hours during the day and evening, before retiring at night, every 4 hours at night). The stretching-relaxing sequence of such a schedule tends to increase bladder muscle tone and promote more voluntary control. Encourage the client to inhibit the urge-to-void sensation when a premature urge to void is experienced. Instruct the client to practice slow, deep breathing until the urge diminishes or disappears.
- When the client finds that voiding can be controlled, the intervals between voiding can be lengthened slightly without loss of continence.
- Regulate fluid intake, particularly during evening hours, to help reduce the need to void during the night.
- Encourage fluids between the hours of 0600 and 1800.
- Avoid excessive consumption of citrus juices, carbonated beverages (especially those containing artificial sweeteners), alcohol, and drinks containing caffeine because these irritate the bladder, increasing the risk of incontinence.
- Schedule diuretics early in the morning.
- Explain to clients that adequate fluid intake is required to ensure adequate urine production that stimulates the micturition reflex.
- Apply protector pads to keep the bed linen dry and provide specially made waterproof underwear to contain the urine and decrease the client's embarrassment. Avoid using diapers, which are demeaning and also suggest that incontinence is permissible.
- Assist the client with an exercise program to increase the general muscle tone and a pelvic muscle exercise program aimed at strengthening the pelvic floor muscles.
- Provide positive reinforcements to encourage continence. Praise clients for attempting to toilet and for maintaining continence.

Pelvic Floor Muscle Exercises

Pelvic floor muscle (PFM), or Kegel, exercises help to strengthen pelvic floor muscles (see Figures 48–3 and 48–4) and can reduce or eliminate episodes of incontinence. The client can identify the perineal muscles by tightening the anal sphincter as if to control the passing of gas or to hold a bowel movement.

Keyock and Newman (2011) describe two types of muscle contractions to practice PFM. One is a quick 2-second contraction where the client squeezes the pelvic muscle quickly and hard and then relaxes immediately. The other is a slow 3- , 5-, or 10-second long contraction. The pelvic muscle is relaxed after the sustained contraction. The client gradually builds up to the 10-second sustained contraction. When the exercise is properly performed, contraction of the muscles of the buttocks and thighs is avoided. PFM can be performed anytime, anywhere, sitting or standing. Specific client instructions for performing PFM are summarized in Client Teaching.

CLIENT TEACHING

Pelvic Floor Muscle Exercises (Kegels)

- Complete two sets of exercises: a quick contraction followed by immediate relaxation and a long contraction followed by relaxation.
- Contract your pelvic floor muscle (PFM) whereby you pull your rectum, urethra, and vagina up inside, and contract the PFM, followed by relaxation. Do *not* hold your breath or tighten your thighs, buttocks, or abdomen while doing PFM exercises.
- Complete 45 of the quick and 45 of the long contraction exercises each day (Keyock & Newman, 2011, p. 32). Gradually increase the long contractions up to a full 10 seconds.
- Make the exercises part of your daily life, for example, before getting out of bed in the morning, when working at the kitchen sink, or on your way to the bathroom. The exercises can be done anywhere, anytime, and in any position.
- To control episodes of stress incontinence, perform a pelvic muscle contraction when initiating any activity that increases intra-abdominal pressure, such as coughing, laughing, sneezing, or lifting.

Maintaining Skin Integrity

Skin that is continually moist becomes macerated (softened). Urine that accumulates on the skin is converted to ammonia, which is very irritating to the skin. Because both skin irritation and maceration predispose the client to skin breakdown and ulceration, the incontinent person requires meticulous skin care. To maintain skin integrity, the nurse washes the client's perineal area with mild soap and water or a commercially prepared no-rinse cleanser after episodes of incontinence. The nurse then rinses the area thoroughly if soap and water were used, and dries it gently and thoroughly. Clean, dry clothing or bed linen should be provided. The nurse applies barrier ointments or creams to protect the skin from contact with urine. If it is necessary to pad the client's clothes for protection, the nurse should use products that absorb wetness and leave a dry surface in contact with the skin.

Specially designed incontinence drawsheets provide significant advantages over standard drawsheets for incontinent clients confined to bed. These sheets are like a drawsheet but are double layered, with a quilted upper nylon or polyester surface and an absorbent viscose rayon layer below. The rayon soaker layer generally has a waterproof backing on its underside. Fluid (i.e., urine) passes through the upper quilted layer and is absorbed and dispersed by the viscose rayon, leaving the quilted surface dry to the touch. This absorbent sheet helps maintain skin integrity; it does not stick to the skin when wet, decreases the risk of bedsores, and reduces odor.

Applying External Urinary Draining Devices

The application of a condom or external catheter connected to a urinary drainage system can be used for incontinent males. Use of a condom appliance is preferable to insertion of a retention catheter because the risk of UTI is minimal.

Methods of applying condoms vary. The nurse needs to follow the manufacturer's instructions when applying a condom. First the nurse determines when the client experiences incontinence. Some clients may require a condom appliance at night only, others continuously. Skill 48–1 describes how to apply and remove an external catheter.

Applying an External Urinary Device

SKILL 48–1

PURPOSES

- To collect urine and control urinary incontinence
- To permit the client physical activity while controlling UI
- To prevent skin irritation as a result of UI

ASSESSMENT

- Review the client record to determine a voiding pattern and other pertinent data, such as latex sensitivity/allergy.
- Apply clean gloves to examine the client's penis for swelling or excoriation that would contraindicate use of the condom catheter.

PLANNING

- Discuss the use of external urinary devices with the client and/or family. Research has shown that condom catheters may be more comfortable than an indwelling catheter and cause fewer urinary tract infections (Kyle, 2011).
- Determine if the client has had an external catheter previously and any difficulties with it.
- Perform any procedures that are best completed without the catheter in place; for example, weighing the client would be easier without the tubing and bag.

DELEGATION

Applying a condom catheter may be delegated to unlicensed assistive personnel (UAP). However, the nurse must determine if the specific client has unique needs such as impaired circulation or latex allergy that would require special training of the UAP in the use of the condom catheter. Abnormal findings must be validated and interpreted by the nurse.

Continued on page 1190

Applying an External Urinary Device—*continued*

SKILL 48–1

Equipment

- Condom sheath of appropriate size: small, medium, large, extra large. Use the manufacturer's size guide as indicated. Use latex-free silicone for clients with latex allergies. Use self-adhering condoms, or those with Velcro, tape, or other external securing device. ❶
- Leg drainage bag if ambulatory or urinary drainage bag with tubing
- Clean gloves
- Basin of warm water and soap
- Washcloth and towel

❶ An external or condom catheter.

IMPLEMENTATION

Preparation

- Assemble the leg drainage bag or urinary drainage bag for attachment to the condom sheath.
- If the condom supplied is not rolled onto itself, roll the condom outward onto itself to facilitate easier application.

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he can participate.
2. Perform hand hygiene and observe other appropriate infection prevention procedures.
3. Position the client in either a supine or a sitting position. Provide for client privacy.
   - Drape the client appropriately with the bath blanket, exposing only the penis.
4. Apply clean gloves.
5. Inspect and clean the penis.
   - Clean the genital area and dry it thoroughly. **Rationale:** *This minimizes skin irritation and excoriation after the condom is applied.*
6. Apply and secure the condom.
   - Roll the condom smoothly over the penis, leaving 2.5 cm. (1 in.) between the end of the penis and the rubber or plastic connecting tube. ❷ **Rationale:** *This space prevents irritation of the tip of the penis and provides for full drainage of urine.*
   - Secure the condom firmly, but not too tightly, to the penis. Some condoms have an adhesive inside the proximal end that adheres to the skin of the base of the penis. Many condoms are packaged with special tape. If neither is present, use a strip of elastic tape or Velcro around the base of the penis over the condom. Ordinary tape is *contraindicated* because it is not flexible and can stop blood flow.
7. Securely attach the urinary drainage system.
   - Make sure that the tip of the penis is not touching the condom and that the condom is not twisted. **Rationale:** *A twisted condom could obstruct the flow of urine.*
   - Attach the urinary drainage system to the condom.
   - Remove and discard gloves.
   - Perform hand hygiene.
   - If the client is to remain in bed, attach the urinary drainage bag to the bed frame.
   - If the client is ambulatory, attach the bag to the client's leg. ❸ **Rationale:** *Attaching the drainage bag to the leg helps control the movement of the tubing and prevents twisting of the thin material of the condom appliance at the tip of the penis.*
8. Teach the client about the drainage system.
   - Instruct the client to keep the drainage bag below the level of the condom and to avoid loops or kinks in the tubing. Instruct the client to report pain, irritation, swelling, or wetness/leaking around the penis to health care personnel.

❷ A self-adhering condom rolled over the penis.

❸ Urinary drainage leg bag.

Applying an External Urinary Device—*continued*

9. Inspect the penis 30 minutes following condom application and at least every 4 hours. Check urine flow. Document these findings.
   - Assess the penis for swelling and discoloration. **Rationale:** *This indicates that the condom is too tight.*
   - Assess urine flow if the client has voided. Normally, some urine is present in the tube if the flow is not obstructed.
   - Assess for redness and/or skin blistering the first few days. **Rationale:** *This could indicate a latex allergy*.
10. Change the condom as indicated and provide skin care. In most settings, the condom is changed daily.
    - Remove the elastic or Velcro strip, apply clean gloves, and roll off the condom.
    - Wash the penis with soapy water, rinse, and dry it thoroughly.
    - Assess the foreskin for signs of irritation, swelling, and discoloration.
    - Reapply a new condom.
    - Remove and discard gloves.
    - Perform hand hygiene.
11. Document in the client record using forms or checklists supplemented by narrative notes when appropriate. Record the application of the condom, the time, and pertinent observations, such as irritated areas on the penis.

SAMPLE DOCUMENTATION

4/22/2015 2145 Condom catheter applied for the night per client request. Glans clean, skin intact. Catheter attached to bedside collection bag, Instructed to notify staff if pain, irritation, swelling, or wetness/leaking occurs. Verbalized that he would ———— L. Chan, RN

EVALUATION

- Perform a detailed follow-up based on findings that deviated from expected or normal for the client. Relate findings to previous assessment data if available.
- Report significant deviations from normal to the primary care provider.

Managing Urinary Retention

Interventions that assist the client to maintain a normal voiding pattern, discussed earlier, also apply when dealing with urinary retention. If these actions are unsuccessful, the primary care provider may order a cholinergic drug such as bethanechol chloride (Urecholine) to stimulate bladder contraction and facilitate voiding. Clients who have a **flaccid** bladder (weak, soft, and lax bladder muscles) may use manual pressure on the bladder to promote bladder emptying. This is known as **Credé's maneuver** or Credé's method. It is not advised without a primary care provider or nurse practitioner's order and is used only for clients who have lost and are not expected to regain voluntary bladder control. When all measures fail to initiate voiding, urinary catheterization may be necessary to empty the bladder completely. An indwelling Foley catheter may be inserted until the underlying cause is treated. Alternatively, intermittent straight catheterization (every 3 to 4 hours) may be performed because the risk of UTI may be less than with an indwelling catheter.

Urinary Catheterization

Urinary catheterization is the introduction of a catheter into the urinary bladder. This is usually performed only when absolutely necessary, because the danger exists of introducing microorganisms into the bladder. The most frequent health care–associated infection is a UTI, and indwelling urethral catheters cause 80% of these UTIs (Institute for Healthcare Improvement [IHI], 2011). A catheter-associated urinary tract infection (**CAUTI**) is a "urinary tract infection that occurs while an indwelling catheter is in place or within 48 hours of its removal" (Seckel, 2013, p. 63). Clients with a CAUTI remain in the hospital longer and need to be placed on antibiotic therapy, which increases health care costs. The high incidence and high costs related to CAUTI, in addition to the fact that most are preventable, resulted in the Centers for Medicare and Medicaid Services (CMS) not reimbursing hospitals unless the CAUTI was documented as present on admission (Magers, 2013). It is well documented that the risk to the client of developing a CAUTI correlates to the duration of the catheter being in place. According to the Centers for Disease Control and Prevention, the risk of infection increases by 5% for each day that a catheter remains in place (Lee & Carter, 2013, p. 53). Oman et al. (2012) reported that urinary catheters are often "retained for days because of convenience, misunderstanding of their necessity/appropriateness, or lack of clear orders for removal" (p. 548). Best practice is to remove a urinary catheter that is not necessary. Box 48–3 provides evidence-based guidelines for preventing CAUTIs.

SAFETY ALERT! SAFETY

2014 National Patient Safety Goals (The Joint Commission, 2013)

Goal 7: Reduce the Risk of Health Care–Associated Infections

- Implement evidence-based practices to prevent indwelling catheter-associated urinary tract infections (CAUTI).
  - Insert indwelling urinary catheters according to established evidence-based guidelines.
  - Manage indwelling urinary catheters according to established evidence-based guidelines.
  - Measure and monitor catheter-associated urinary tract infection prevention processes and outcomes in high-volume areas.

Another hazard is trauma with urethral catheterization, particularly in the male client, whose urethra is longer and more tortuous. It is important to insert a catheter along the normal contour of the urethra. Damage to the urethra can occur if the catheter is forced through strictures or at an incorrect angle. In males, the urethra is normally curved, but it can be straightened by elevating the penis to a position perpendicular to the body.

BOX 48–3 Preventing or Reducing the Risk of CAUTIs

AVOID UNNECESSARY USE OF URINARY CATHETERS
- Develop criteria for appropriate catheter insertion.
- Consider alternatives to an indwelling catheter such as external condom catheter.
- Use a bladder scanner to assess for urinary retention.

INSERT URINARY CATHETERS USING ASEPTIC TECHNIQUE
- Catheters should only be inserted by trained individuals.
- Use aseptic technique and sterile equipment.
- Catheter kit should include a catheter and all necessary items in one place.
- Use the smallest catheter possible that allows for proper drainage and decreases urethral trauma.

MAINTAIN THE URINARY CATHETER
- Use hand hygiene and standard precautions during any manipulation of the catheter or collecting system.
- Maintain a sterile, closed drainage system.
- Maintain unobstructed urine flow; keep catheter and tubing from kinking.
- Keep the collection bag below the level of the bladder at all times, but do not rest the bag on the floor.
- Empty the collection bag regularly with a separate, clean collecting container for each client; and prevent contact of the drainage spigot with the nonsterile collecting container.

PRACTICES TO AVOID
- Irrigation of catheters, except in cases of catheter obstruction
- Disconnecting the catheter from the drainage tubing
- Replacing catheters routinely
- Cleaning the periurethral area with antiseptics. Routine hygiene (cleaning the meatus during daily bathing) is appropriate

REVIEW URINARY CATHETER NECESSITY DAILY AND REMOVE PROMPTLY
- Assess the need for catheter in daily nursing assessments; contact the primary care provider if criteria not met.
- Develop nursing protocols that allow nurses to remove urinary catheters if criteria for necessity are not met and there are no contraindications for removal.
- Implement automatic stop orders for 48 to 72 hours after catheter insertion. Continue catheter use only with a documented order from the primary care provider.
- Use alerts in chart or computerized charting system to inform the primary care provider of the presence of a catheter and require an order for continued use.

From *How-to-Guide: Prevent Catheter-Associated Urinary Tract Infections*,by IHI, 2011,Cambridge, MA: Author; "Using Evidence-Based Practice to Reduce Catheter-Associated Urinary Tract Infections, by T. L. Magers, 2013, *American Journal of Nursing*, *113*(6), pp. 34–42; and "Maintaining Urinary Catheters: What Does the Evidence Say?" by M. A. Seckel, 2013, *Nursing*, *43*(2), pp. 63–65.

BOX 48–4 Selecting a Urinary Catheter

- Determine the appropriate catheter length by the client's gender. For adult female clients use a 22-cm catheter; for adult male clients, a 40-cm catheter.
- Determine appropriate catheter size by the size of the urethral canal. Use sizes such as #8 or #10 for children, #14 or #16 for adults. Men frequently require a larger size than women, for example, #18. The lumen of a silicone catheter is slightly larger than that of a same-sized latex catheter.
- Select the appropriate balloon size. For adults, use a 5-mL balloon to facilitate optimal urine drainage. The smaller balloons allow more complete bladder emptying because the catheter tip is closer to the urethral opening in the bladder. However, a 30-mL balloon is commonly used to achieve hemostasis of the prostatic area following a prostatectomy. Use 3-mL balloons for children.

Catheters are commonly made of rubber or plastics although they may be made from latex, silicone, or polyvinyl chloride (PVC). They are sized by the diameter of the lumen using the French (Fr) scale: the larger the number, the larger the lumen. Either straight catheters, inserted to drain the bladder and then immediately removed, or retention catheters, which remain in the bladder to drain urine, may be used. Box 48–4 provides guidelines for catheter selection.

The straight catheter is a single-lumen tube with a small eye or opening about 1.25 cm (0.5 in.) from the insertion tip (Figure 48–8 ■).

The retention, or Foley, catheter is a double-lumen catheter. The outside end of this two-way retention catheter is bifurcated; that is, it has two openings, one to drain the urine, the other to inflate the balloon (Figure 48–9 ■). The larger lumen drains urine from the bladder and the second smaller lumen is used to inflate the balloon near the tip of the catheter to hold the catheter in place within the bladder. Some catheter manufacturers apply an antimicrobial coating to their catheters to reduce CAUTIs.

A variation of the indwelling catheter is the coudé (elbowed) catheter, which has a curved tip (Figure 48–10 ■). This is sometimes used for men who have a hypertrophied prostate, because its tip is somewhat stiffer than a regular catheter and thus it can be better controlled during insertion, and passage is often less traumatic.

Clients who require continuous or intermittent bladder irrigation may have a three-way Foley catheter (Figure 48–11 ■). The three-way catheter has a third lumen through which sterile irrigating fluid can flow into the bladder. The fluid then exits the bladder through the drainage lumen, along with the urine.

The size of the retention catheter balloon is indicated on the catheter along with the diameter, for example, "#16 Fr—5 mL balloon." The purpose of the catheter balloon is to secure the catheter in the bladder. Historically, nurses pretested the catheter balloon to prevent insertion of a defective catheter. Some catheter manufacturers (e.g., Bard) test the balloon as part of their quality assurance process and do not recommend pretesting of the balloon by the nurse. Pretesting of *silicone* balloons in particular is *not* recommended because the silicone can form a cuff or crease at the balloon area that can cause trauma to the urethra during catheter insertion. It is important to follow the manufacturer's instructions for the proper volume to use for balloon inflation. Improperly inflated catheter balloons may cause drainage and deflation difficulties.

Retention catheters are usually connected to a closed gravity drainage system. This system consists of the catheter, drainage tubing, and a collecting bag for the urine. A closed system cannot be opened anywhere along the system, from catheter to collecting bag. Some health facilities, however, may use an open system, which consists of

Figure 48–8 ■ Red-rubber or plastic Robinson straight catheters.
Courtesy Covidien.

Figure 48–9 ■ An indwelling/retention (Foley) catheter with the balloon inflated.

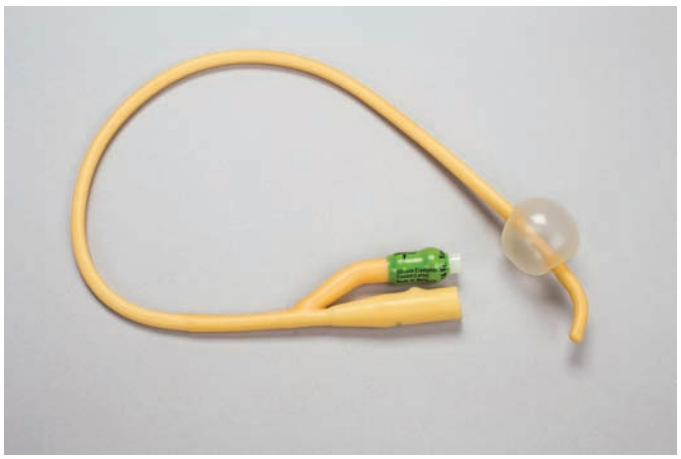


Figure 48–10 ■ A coudé catheter.

Figure 48–11 ■ A three-way Foley catheter often used for continuous bladder irrigation.
Courtesy Covidien.

separate packages for the catheter and the drainage tubing and collecting bag. The open system requires the nurse to be especially vigilant to ensure sterile technique is maintained when connecting the catheter and drainage tubing. The closed system is preferred because it reduces the risk of microorganisms entering the system and infecting the urinary tract. Urinary drainage systems typically depend on the force of gravity to drain urine from the bladder to the collecting bag.

Skill 48–2 describes catheterization of females and males, using straight and retention catheters.

SKILL 48–2

Performing Urinary Catheterization

PURPOSES

- To relieve discomfort due to bladder distention or to provide gradual decompression of a distended bladder
- To assess the amount of residual urine if the bladder empties incompletely
- To obtain a sterile urine specimen
- To empty the bladder completely prior to surgery
- To facilitate accurate measurement of urinary output for critically ill clients whose output needs to be monitored hourly
- To provide for intermittent or continuous bladder drainage and/or irrigation
- To prevent urine from contacting an incision after perineal surgery

ASSESSMENT

- Determine the most appropriate method of catheterization based on the purpose and any criteria specified in the order such as total amount of urine to be removed or size of catheter to be used.
- Use a straight catheter if only a one-time urine specimen is needed, if amount of residual urine is being measured, or if temporary decompression/emptying of the bladder is required.
- Use an indwelling/retention catheter if the bladder must remain empty, intermittent catheterization is contraindicated, or continuous urine measurement/collection is needed.
- Assess the client's overall condition. Determine if the client is able to participate and hold still during the procedure and if the client can be positioned supine with head relatively flat. For female clients, determine if she can have knees bent and hips externally rotated.
- Determine when the client last voided or was last catheterized.
- If catheterization is being performed because the client has been unable to void, when possible, complete a bladder scan to assess the amount of urine present in the bladder. **Rationale:** *This prevents catheterizing the bladder when insufficient urine is present. Often, a minimum of 500 to 800 mL of urine indicates urinary retention and the client should be reassessed until that amount is present.*

PLANNING

- Allow adequate time to perform the catheterization. Although the entire procedure can require as little as 15 minutes, several sources of difficulty could result in a much longer period of time. If possible, it should not be performed just prior to or after a meal.
- Some clients may feel uncomfortable being catheterized by nurses of the opposite gender. If this is the case, obtain the client's permission. Also consider whether agency policy requires or encourages having a person of the client's same gender present for the procedure.

DELEGATION

Due to the need for sterile technique and detailed knowledge of anatomy, insertion of a urinary catheter is not delegated to UAP.

Equipment

- Sterile catheter of appropriate size (An extra catheter should also be at hand.)
- Catheterization kit (1) or individual sterile items:
  - Sterile gloves
  - Waterproof drape(s)
  - Antiseptic solution
  - Cleansing balls
  - Forceps
  - Water-soluble lubricant
  - Urine receptacle
  - Specimen container

(1) A closed indwelling catheter insertion kit.

- For an indwelling catheter:
  - Syringe prefilled with sterile water in amount specified by catheter manufacturer
  - Collection bag and tubing
- 5–10 mL 2% Xylocaine gel or water-soluble lubricant for male urethral injection (if agency permits)
- Clean gloves
- Supplies for performing perineal cleansing
- Bath blanket or sheet for draping the client
- Adequate lighting (Obtain a flashlight or lamp if necessary.)

IMPLEMENTATION

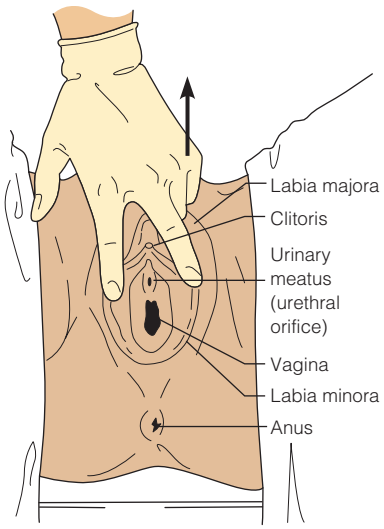
Preparation

- If using a catheterization kit, read the label carefully to ensure that all necessary items are included.
- Apply clean gloves and perform routine perineal care to cleanse gross contamination. For women, use this time to locate the urinary meatus relative to surrounding structures. (2)
- Remove and discard gloves.
  - Perform hand hygiene.

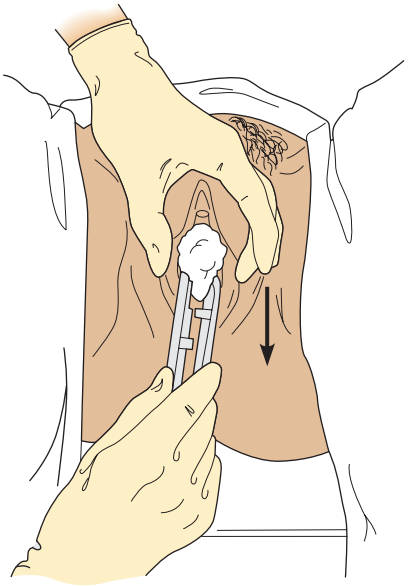
Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate.
2. Perform hand hygiene and observe other appropriate infection prevention procedures.
3. Provide for client privacy.

Performing Urinary Catheterization—*continued*



2 To expose the urinary meatus, separate the labia minora and retract the tissue upward.



3 When cleaning the urinary meatus, move the swab downward.

4. Place the client in the appropriate position and drape all areas except the perineum.
   - *Female:* supine with knees flexed, feet about 2 feet apart, and hips slightly externally rotated, if possible
   - *Male:* supine, thighs slightly abducted or apart
5. Establish adequate lighting. Stand on the client's right if you are right-handed, on the client's left if you are left-handed.
6. If using a collecting bag and it is not contained within the catheterization kit, open the drainage package and place the end of the tubing within reach. **Rationale:** *Because one hand is needed to hold the catheter once it is in place, open the package while two hands are still available.*
7. If agency policy permits, apply clean gloves and inject 10 to 15 mL Xylocaine gel into the urethra of the male client. Wipe the underside of the penile shaft to distribute the gel up the urethra. Wait at least 5 minutes for the gel to take effect before inserting the catheter.
8. Remove and discard gloves.
   - Perform hand hygiene.
9. Open the catheterization kit. Place a waterproof drape under the buttocks (female) or penis (male) without contaminating the center of the drape with your hands.
10. Apply sterile gloves.
11. Organize the remaining supplies:
    - Saturate the cleansing balls with the antiseptic solution.
    - Open the lubricant package.
    - Remove the specimen container and place it nearby with the lid loosely on top.
12. Attach the prefilled syringe to the indwelling catheter inflation hub. Apply agency policy and/or manufacturer recommendation regarding pretesting of the balloon. **Rationale:** *There is little research regarding pretesting of the balloon; however, some balloons (e.g., silicone) may form a cuff on deflation that can irritate the urethra on insertion.*
13. Lubricate the catheter 2.5 to 5 cm (1 to 2 in.) for females, 15 to 17.5 cm (6 to 7 in.) for males, and place it with the drainage end inside the collection container.
14. If desired, place the fenestrated drape over the perineum, exposing the urinary meatus.
15. Cleanse the meatus. Note: *The nondominant hand is considered contaminated once it touches the client's skin.*
    - *Females:* Use your nondominant hand to spread the labia so that the meatus is visible. Establish firm but gentle pressure on the labia. The antiseptic may make the tissues slippery but the labia must not be allowed to return over the cleaned meatus. Note: *Location of the urethral meatus is best identified during the cleansing process. Pick up a cleansing ball with the forceps in your dominant hand and wipe one side of the labia majora in an anteroposterior direction.* 3 Use great care that wiping the client does not contaminate this sterile hand. Use a new ball for the opposite side. Repeat for the labia minora. Use the last ball to cleanse directly over the meatus.
    - *Males:* Use your nondominant hand to grasp the penis just below the glans. If necessary, retract the foreskin. Hold the penis firmly upright, with slight tension. **Rationale:** *Lifting the penis in this manner helps straighten the urethra.* Pick up a cleansing ball with the forceps in your dominant hand and wipe from the center of the meatus in a circular motion around the glans. Use great care that wiping the client does not contaminate the sterile hand. Use a new ball and repeat three more times. The antiseptic may make the tissues slippery but the foreskin must not be allowed to return over the cleaned meatus nor the penis be dropped.
16. Insert the catheter.
    - Grasp the catheter firmly 5 to 7.5 cm (2 to 3 in.) from the tip. Ask the client to take a slow deep breath and insert the catheter as the client exhales. Slight resistance is expected as the catheter passes through the sphincter. If necessary, twist the catheter or hold pressure on the catheter until the sphincter relaxes.
    - Advance the catheter 5 cm (2 in.) farther after the urine begins to flow through it. **Rationale:** *This is to be sure it is fully in the bladder, will not easily fall out, and the balloon is in the bladder completely.* For male clients, some experts recommend advancing the catheter to the "Y" bifurcation of the catheter. Check your agency's policy.

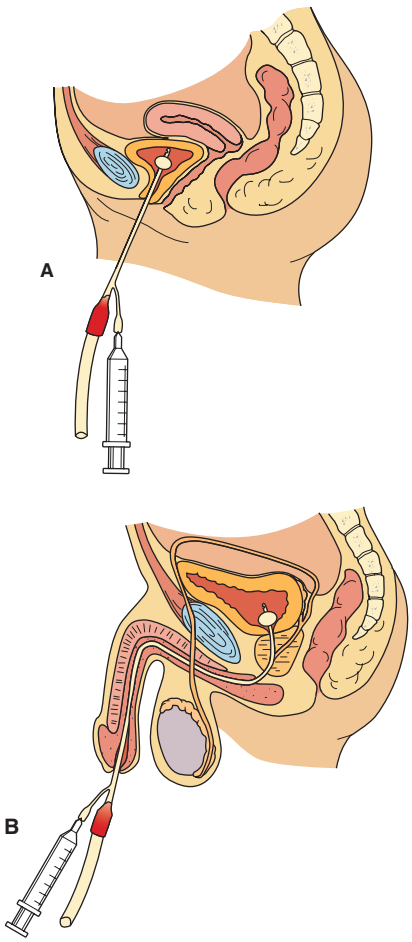
Continued on page 1196

Performing Urinary Catheterization—*continued*

SKILL 48–2

- If the catheter accidentally contacts the labia or slips into the vagina, it is considered contaminated and a new, sterile catheter must be used. The contaminated catheter may be left in the vagina until the new catheter is inserted to help avoid mistaking the vaginal opening for the urethral meatus.

17. Hold the catheter with the nondominant hand.
18. For an indwelling catheter, inflate the retention balloon with the designated volume.
    - Without releasing the catheter (and, for females, without releasing the labia), hold the inflation valve between two fingers of your nondominant hand while you attach the syringe (if not left attached earlier) and inflate with your dominant hand. If the client complains of discomfort, immediately withdraw the instilled fluid, advance the catheter farther, and attempt to inflate the balloon again.
    - Pull gently on the catheter until resistance is felt to ensure that the balloon has inflated and to place it in the trigone of the bladder. 4
19. Collect a urine specimen if needed. For a straight catheter, allow 20 to 30 mL to flow into the bottle without touching the catheter to the bottle. For an indwelling catheter preattached to a drainage bag, a specimen may be taken from the bag this initial time only.
20. Allow the straight catheter to continue draining into the urine receptacle. If necessary (e.g., open system), attach the drainage end of an indwelling catheter to the collecting tubing and bag.
21. Examine and measure the urine. In some cases, only 750 to 1,000 mL of urine are to be drained from the bladder at one time. Check agency policy for further instructions if this should occur.
22. Remove the straight catheter when urine flow stops. For an indwelling catheter, secure the catheter tubing to the thigh for female clients or the upper thigh or lower abdomen for male clients to prevent movement on the urethra or excessive tension or pulling on the retention balloon (Fisher, 2010; Herter & Kazer, 2010). Adhesive and nonadhesive catheter-securing devices are available and should be used to secure the catheter tubing to the client. 5 **Rationale:** *This prevents unnecessary trauma to the urethra.*



4 Placement of indwelling catheter and inflated balloon of a closed system in *A,* female client and *B,* male client.

A

B

5 Catheter securement devices: *A,* nonadhesive device (Velcro strap); *B,* adhesive device.

Performing Urinary Catheterization—*continued*

6 Correct position for urine drainage bag and tubing.

23. Next, hang the bag below the level of the bladder. No tubing should fall below the top of the bag. 6
24. Wipe any remaining antiseptic or lubricant from the perineal area. Replace the foreskin if retracted earlier. Return the client to a comfortable position. Instruct the client on positioning and moving with the catheter in place.
25. Discard all used supplies in appropriate receptacles.
26. Remove and discard gloves.
    - Perform hand hygiene.
27. Document the catheterization procedure including catheter size and results in the client record using forms or checklists supplemented by narrative notes when appropriate.

SAMPLE DOCUMENTATION

2/24/2015 0530 Client agreed to insertion of pre-op catheter as per order. #16 Fr Foley with 5-mL balloon inserted without difficulty, secured to thigh, connected to straight drainage. Immediate return of 300 mL pale, clear, yellow urine ———————— G. Hampton, RN

EVALUATION

- Notify the primary care provider of the catheterization results.
- Perform a detailed follow-up based on findings that deviated from expected or normal for the client. Relate findings to previous assessment data if available.
- Teach the client how to care for the indwelling catheter, to drink more fluids, and provide other appropriate instructions.

LIFESPAN CONSIDERATIONS CATHETERIZATION

Infants and Children

- Adapt the size of the catheter for pediatric clients.
- Ask a family member to assist in holding the child during catheterization, if appropriate.

OLDER ADULTS

When catheterizing older clients, be very attentive to problems of limited movement, especially in the hips. Arthritis, or previous hip or knee surgery, may limit their movement and cause discomfort. Modify the position (e.g., side-lying) as needed to perform the procedure safely and comfortably. For women, obtain the assistance of another nurse to flex and hold the client's knees and hips as necessary or place her in a modified Sims' position.

Home Care Considerations Catheterization

PATIENT-CENTERED CARE

For intermittent catheterization, instruct the client to:

- Follow instructions for clean technique.
- Wash hands well with warm water and soap prior to handling equipment or performing catheterization.
- Monitor for signs and symptoms of UTI including burning, urgency, abdominal pain, and cloudy urine; in older adults, confusion may be an early sign.
- Ensure adequate oral intake of fluids.
- After each catheterization, assess the urine for color, odor, clarity, and the presence of blood.
- Wash rubber catheters thoroughly with soap and water after use, dry, and store in a clean place.

For indwelling catheters, instruct the client to:

- Never pull on the catheter.
- Secure the catheter tubing to your leg using a catheter-securing device.
- Ensure that there are no kinks or twists in the tubing.
- Keep the urine drainage bag below the level of the bladder. A leg bag may substitute for a hanging bag for those who are upright.
- Empty the drainage bag regularly.
- Take a shower rather than a tub bath. *Sitting in a tub allows bacteria easier access to the urinary tract.*
- Monitor for signs and symptoms of UTI including burning, urgency, abdominal pain, cloudy urine; in older adults, confusion may be an early sign.
- Ensure adequate oral intake of fluids.

Clients who have indwelling catheters for lengthy periods of time need to have the catheter and bag changed at regular intervals. Changing equipment once a month is often the standard, although agency policy may differ.

Nursing Interventions for Clients with Indwelling Catheters

Nursing care of the client with an indwelling catheter and continuous drainage is largely directed toward preventing infection of the urinary tract and encouraging urinary flow through the drainage system. It includes encouraging large amounts of fluid intake, accurately recording the fluid intake and output, changing the retention catheter and tubing, maintaining the patency of the drainage system, preventing contamination of the drainage system, and teaching these measures to the client.

Fluids

The client with a retention catheter should drink up to 3,000 mL/day if permitted. Large amounts of fluid ensure a large urine output, which keeps the bladder flushed out and decreases the likelihood of urinary stasis and subsequent infection. Large volumes of urine also minimize the risk of sediment or other particles obstructing the drainage tubing.

Dietary Measures

Acidifying the urine of clients with a retention catheter may reduce the risk of UTI and calculus formation. Foods such as eggs, cheese, meat and poultry, whole grains, cranberries, plums and prunes, and tomatoes tend to increase the acidity of urine. Conversely, most fruits and vegetables, legumes, and milk and milk products result in alkaline urine.

Perineal Care

No special cleaning other than routine hygienic care is necessary for clients with retention catheters, nor is special meatal care recommended. The nurse should check agency practice in this regard.

Changing the Catheter and Tubing

Routine changing of catheter and tubing is *not* recommended. Collection of sediment in the catheter or tubing and impaired urine drainage are indicators for changing the catheter and drainage system. When this occurs the catheter and drainage system are removed and discarded, and a new sterile catheter with a closed drainage system is inserted using aseptic technique.

Removing Indwelling Catheters

Indwelling catheters are removed after their purpose has been achieved, usually on the order of the primary care provider. Unfortunately, not all primary care providers know which of their clients has an indwelling catheter. As a result, some facilities have incorporated an alert system that requires the provider to take an action after a specified time frame. Also, some health care facilities allow the nurse to remove an indwelling catheter through the use of a protocol with specific criteria (Wenger, 2010).

If the catheter has been in place for a short time (e.g., 48 to 72 hours), the client usually has little difficulty regaining normal urinary elimination patterns. Swelling of the urethra, however, may initially interfere with voiding, so the nurse should regularly assess the client for urinary retention until voiding is reestablished.

Clients who have had a retention catheter for a prolonged period may require bladder retraining to regain bladder muscle tone. With an indwelling catheter in place, the bladder muscle does not stretch and contract regularly as it does when the bladder fills and empties by voiding. A few days before removal, the catheter may be clamped for specified periods of time (e.g., 2 to 4 hours), then released to allow the bladder to empty. This allows the bladder to distend and stimulates its musculature. Check agency policy regarding bladder training procedures.

To remove a retention catheter the nurse follows these steps:

- Obtain a receptacle for the catheter (e.g., a disposable basin); a clean, disposable towel; clean gloves; and a sterile syringe to deflate the balloon. The syringe should be large enough to withdraw all the solution in the catheter balloon. The size of the balloon is indicated on the label at the end of the catheter.
- Ask the client to assume a supine position as for a catheterization.
- *Optional:* Obtain a sterile specimen before removing the catheter. Check agency protocol.
- Remove the catheter-securing device attaching the catheter to the client, apply gloves, and then place the towel between the legs of the female client or over the thighs of the male.
- Insert the syringe into the injection port of the catheter, and withdraw the fluid from the balloon. After the fluid has been aspirated, the walls of the balloon do not deflate to their original shape but collapse into uneven ridges, forming a "cuff" around the catheter. This cuff is more pronounced with a silicone catheter (Wilson, 2012). This cuff can cause discomfort to the client as the catheter is removed. Little research exists about the balloon cuffing that occurs following deflation of a catheter balloon. One recent research study by Chung and So (2012) specifically tested four balloon deflation methods. They found that active deflation (rapid deflation of balloon within 5 seconds) caused the greatest degree of catheter balloon cuffing, followed by passive deflation (very slow active deflation over 30 seconds). Passive autodeflation (attaching an empty syringe to the balloon inflow channel to allow for gentle autodeflation) and excision of the balloon inflow channel caused the least cuffing (p. 176).
- Do not pull the catheter while the balloon is inflated; doing so will injure the urethra.
- After all of the fluid is removed from the balloon, gently withdraw the catheter and place it in the waste receptacle.
- Dry the perineal area with a towel.
  - Measure the urine in the drainage bag.
- Remove and discard gloves.
  - Perform hand hygiene.
- Record the removal of the catheter. Include in the recording (a) the time the catheter was removed; (b) the amount, color, and clarity of the urine; (c) the intactness of the catheter; and (d) instructions given to the client.
- Provide the client with either a urinal (men), bedpan, commode, or toilet collection device ("hat") to be used with each, subsequent unassisted void.
- Following removal of the catheter, determine the time of the first voiding and the amount voided during the first 8 hours. Compare this output to the client's intake.
- Observe for dysfunctional voiding behaviors (i.e., $<$ 100 mL per void), which might indicate urinary retention. If this occurs, perform an assessment of PVR using a bladder scanner if available.

CLIENT TEACHING

Clean Intermittent Self-Catheterization

- Catheterize as often as needed to maintain. At first, catheterization may be necessary every 2 to 3 hours, increasing to 4 to 6 hours.
- Attempt to void before catheterization; insert the catheter to remove residual urine if unable to void or if amount voided is insufficient (e.g., less than 100 mL).
- Assemble all needed supplies ahead of time. Good lighting is essential, especially for women.
- Wash your hands.
- Clean the urinary meatus with either a towelette or soapy washcloth, then rinse with a wet washcloth. Women should clean the area from front to back.
- Assume a position that is comfortable and that facilitates passage of the catheter, such as a semireclining position in bed or sitting on a chair or the toilet. Men may prefer to stand over the toilet; women may prefer to stand with one foot on the side of the bathtub.
- Apply lubricant to the catheter tip (1 in. [2.5 cm] for women; 2 to 6 in. [5 to 15 cm] for men).
- Insert the catheter until urine flows through.
  a. If a woman, locate the meatus using a mirror or other aid, or use the "touch" technique as follows:
     - Place the index finger of your nondominant hand on your clitoris.
     - Place the third and fourth fingers at the vagina.
     - Locate the meatus between the index and third fingers.
     - Direct the catheter through the meatus and then upward and forward.
  b. If a man, hold the penis with a slight upward tension at a 60- to 90-degree angle to insert the catheter. Return the penis to its natural position when urine starts to flow.
- Hold the catheter in place until all urine is drained.
- Withdraw the catheter slowly *to ensure complete drainage of urine.*
- Wash the catheter with soap and water; store in a clean container. Replace the catheter when it becomes difficult to clean, or too soft or hard to insert easily.
- Contact your care provider if your urine becomes cloudy or contains sediment; if you have bleeding, difficulty, or pain when passing the catheter; or if you have a fever.
- Drink at least 2,000 to 2,500 mL of fluid a day *to ensure adequate bladder filling and flushing.* To keep your urine acidic and reduce the risk of bladder infections, drink cranberry and prune juices.

Generally a PVR greater than 200 mL will require straight catheterization as needed.

Clean Intermittent Self-Catheterization

Clean intermittent self-catheterization (CISC) is performed by many clients who have some form of neurogenic bladder dysfunction such as that caused by spinal cord injury and multiple sclerosis. Clean or medical aseptic technique is used. Intermittent self-catheterization has these benefits:

- Enables the client to retain independence and gain control of the bladder.
- Reduces incidence of UTI.
- Protects the upper urinary tract from reflux.
- Allows normal sexual relations without incontinence.
- Reduces the use of aids and appliances.
- Frees the client from embarrassing dribbling.

The procedure for self-catheterization is similar to that used by the nurse to catheterize a client. Essential steps are outlined in the accompanying Client Teaching. Because the procedure requires physical and mental preparation, client assessment is important. The client should have:

- Sufficient manual dexterity to manipulate a catheter
- Sufficient mental ability
- Motivation and acceptance of the procedure
- For women, reasonable agility to access the urethra
- Bladder capacity greater than 100 mL.

Before teaching CISC, the nurse should establish the client's voiding patterns, the volume voided, fluid intake, and residual amounts. CISC is easier for males to learn because of the visibility of the urinary meatus. Females need to learn initially with the aid of a mirror but eventually should perform the procedure by using only the sense of touch (as described in Client Teaching).

Urinary Irrigations

An **irrigation** is a flushing or washing-out with a specified solution. Bladder irrigation is carried out on a primary care provider's order, usually to wash out the bladder and sometimes to apply a medication to the bladder lining. Catheter irrigations may also be performed to maintain or restore the patency of a catheter, for example, to remove pus or blood clots blocking the catheter. Sterile technique is used.

The closed method is the preferred technique for catheter or bladder irrigation because it is associated with a lower risk of UTI. Closed catheter irrigations may be either continuous or intermittent. This method is most often used for clients who have had genitourinary surgery. The continuous irrigation helps prevent blood clots from occluding the catheter. A three-way, or triple lumen, catheter (see Figure 48–11) is generally used for closed irrigations. The irrigating solution flows into the bladder through the irrigation port of the catheter and out through the urinary drainage lumen of the catheter.

Occasionally an open irrigation may be necessary to restore catheter patency. The risk of injecting microorganisms into the urinary tract is greater with open irrigations, because the connection between the indwelling catheter and the drainage tubing is broken. Strict precautions must be taken to maintain the sterility of both the drainage tubing connector and the interior of the indwelling catheter.

The open method of catheter or bladder irrigation is performed with double-lumen indwelling catheters. It may be necessary for clients who develop blood clots and mucous fragments that occlude the catheter or when it is undesirable to change the catheter. Techniques for bladder irrigation are outlined in Skill 48–3.

SKILL 48–3

Performing Bladder Irrigation

PURPOSES

- To maintain the patency of a urinary catheter and tubing (closed continuous irrigation)
- To free a blockage in a urinary catheter or tubing (open intermittent irrigation)

ASSESSMENT

- Determine the client's current urinary drainage system. Review the client record for recent intake and output and any difficulties the client has been experiencing with the system. Review the results of previous irrigations.
- Assess the client for any discomfort, bladder spasms, or distended bladder.

PLANNING

Before irrigating a catheter or bladder, check (a) the reason for the irrigation; (b) the order authorizing the continuous or intermittent irrigation (in most agencies, a primary care provider's order is required); (c) the type of sterile solution, the amount and strength to be used, and the rate (if continuous); and (d) the type of catheter in place. If these are not specified on the client's chart, check agency protocol.

DELEGATION

Due to the need for sterile technique, urinary irrigation is generally not delegated to UAP. If the client has continuous irrigation, the UAP may care for the client and note abnormal findings. These must be validated and interpreted by the nurse.

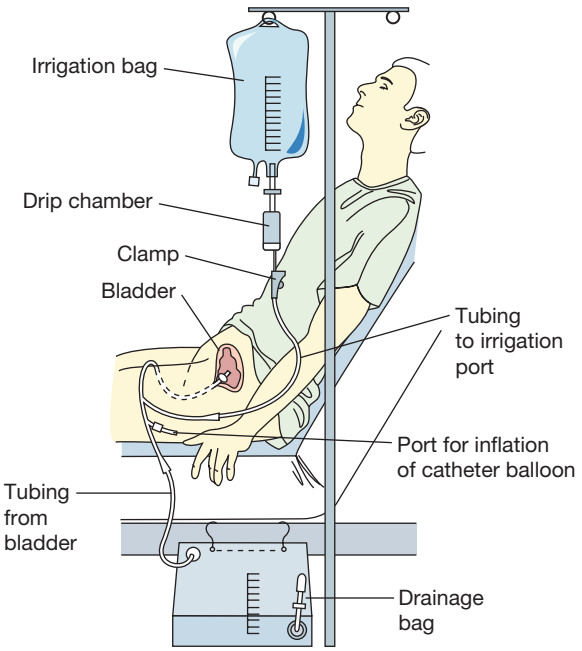
Equipment

- Clean gloves (two pairs)
- Retention catheter in place
- Drainage tubing and bag (if not in place)
- Drainage tubing clamp
- Antiseptic swabs
- Sterile receptacle
- Sterile irrigating solution warmed or at room temperature (Label the irrigant clearly with the words *Bladder Irrigation*, including the information about any medications that have been added to the original solution, and the date, time, and nurse's initials.)
- Infusion tubing
- IV pole

IMPLEMENTATION

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. The irrigation should not be painful or uncomfortable. Discuss how the results will be used in planning further care or treatments.
2. Perform hand hygiene and observe other appropriate infection prevention procedures.
3. Provide for client privacy.
4. Apply clean gloves.
5. Empty, measure, and record the amount and appearance of urine present in the drainage bag. **Rationale:** *Emptying the drainage bag allows more accurate measurement of urinary output after the irrigation is in place or completed. Assessing the character of the urine provides baseline data for later comparison.*
6. Discard urine and gloves.
7. Prepare the equipment.
   - Perform hand hygiene.
   - Connect the irrigation infusion tubing to the irrigating solution and flush the tubing with solution, keeping the tip sterile. **Rationale:** *Flushing the tubing removes air and prevents it from being instilled into the bladder.*
   - Apply clean gloves and cleanse the port with antiseptic swabs.
   - Connect the irrigation tubing to the input port of the three-way catheter.
   - Connect the drainage bag and tubing to the urinary drainage port if not already in place.
   - Remove and discard gloves.
   - Perform hand hygiene.
8. Irrigate the bladder.
   - For closed continuous irrigation using a three-way catheter, open the clamp on the urinary drainage tubing (if present). ❶ **Rationale:** *This allows the irrigating solution to flow out of the bladder continuously.*
     a. Apply clean gloves.
     b. Open the regulating clamp on the irrigating fluid infusion tubing and adjust the flow rate as prescribed by the primary care provider or to 40 to 60 drops per minute if not specified.
     c. Assess the drainage for amount, color, and clarity. The amount of drainage should equal the amount of irrigant entering the bladder plus expected urine output. Empty the bag frequently so that it does not exceed half full.
   - For closed intermittent irrigation, determine whether the solution is to remain in the bladder for a specified time.
     a. If the solution is to remain in the bladder (a bladder irrigation or instillation), close the clamp to the urinary drainage



❶ A continuous bladder irrigation (CBI) setup.

Performing Bladder Irrigation—*continued*

tubing. **Rationale:** *Closing the flow clamp allows the solution to be retained in the bladder and in contact with bladder walls.*

b. If the solution is being instilled to irrigate the catheter, open the flow clamp on the urinary drainage tubing. **Rationale:** *Irrigating solution will flow through the urinary drainage port and tubing, removing mucous shreds or clots.*

c. If a three-way catheter is used, open the flow clamp to the irrigating fluid infusion tubing, allowing the specified amount of solution to infuse. Then close the clamp on the infusion tubing.

or

d. If a two-way catheter is used, connect an irrigating syringe with a needleless adapter to the injection port on the drainage tubing and instill the solution.

e. After the specified period the solution is to be retained has passed, open the drainage tubing flow clamp and allow the bladder to empty.

f. Assess the drainage for amount, color, and clarity. The amount of drainage should equal the amount of irrigant entering the bladder plus expected urine output.

g. Remove and discard gloves.
- Perform hand hygiene.

9. Assess the client and the urinary output.
- Assess the client's comfort.
- Apply clean gloves.
- Empty the drainage bag and measure the contents. Subtract the amount of irrigant instilled from the total volume of drainage to obtain the volume of urine output.
- Remove and discard gloves.
  - Perform hand hygiene.

10. Document findings in the client record using forms or checklists supplemented by narrative notes when appropriate.
- Note any abnormal constituents such as blood clots, pus, or mucous shreds.

Variation: Open Irrigation Using a Two-Way Indwelling Catheter

1. Assemble the equipment. Use an irrigation tray (2) or assemble individual items, including:
- Clean gloves
- Disposable water-resistant towel
- Sterile irrigating solution
- Sterile irrigation set
- Sterile basin
- Sterile 30- to 50-mL irrigating syringe
- Antiseptic swabs
- Sterile protective cap for catheter drainage tubing

2. Prepare the client (see steps 1–5 of main procedure for catheter irrigation).

3. Prepare the equipment.
- Perform hand hygiene.
- Using aseptic technique, open supplies and pour the irrigating solution into the sterile basin or receptacle. **Rationale:** *Aseptic technique is vital to reduce the risk of instilling microorganisms into the urinary tract during the irrigation.*

(2) An irrigation set.

- Place the disposable water-resistant towel under the catheter.
- Apply clean gloves.
- Disconnect catheter from drainage tubing and place the catheter end in the sterile basin. Place sterile protective cap over end of drainage tubing. **Rationale:** *The end of the drainage tubing will be considered contaminated if it touches bed linens or skin surfaces.*
- Draw the prescribed amount of irrigating solution into the syringe, maintaining the sterility of the syringe and solution.

4. Irrigate the bladder.
- Insert the tip of the syringe into the catheter opening.
- Gently and slowly inject the solution into the catheter at approximately 3 mL per second. In adults, about 30 to 40 mL generally is instilled for catheter irrigations; 100 to 200 mL may be instilled for bladder irrigation or instillation. **Rationale:** *Gentle instillation reduces the risks of injury to bladder mucosa and of bladder spasms.*
- Remove the syringe and allow the solution to drain back into the basin.
- Continue to irrigate the client's bladder until the total amount to be instilled has been injected or when fluid returns are clear and/or clots are removed.
- Remove the protective cap from the drainage tube and wipe with antiseptic swab.
- Reconnect the catheter to drainage tubing.
- Remove and discard gloves.
- Perform hand hygiene.
- Assess the drainage for amount, color, and clarity. The amount of drainage should equal the amount of irrigant entering the bladder plus any urine that may have been dwelling in the bladder. Determine the amount of fluid used for the irrigation and subtract from total output on the client's I&O record.

5. Assess the client and the urinary output and document the procedure as in steps 8 and 9 above.

EVALUATION
- Perform detailed follow-up based on findings that deviated from expected or normal for the client. Relate findings to previous assessment data if available.
- Report significant deviations from normal to the primary care provider.

Suprapubic Catheter Care

A **suprapubic catheter** is inserted surgically through the abdominal wall above the symphysis pubis into the urinary bladder. The suprapubic catheter may have a balloon or pigtail that holds it in the bladder depending on the manufacturer (Figure 48–12 ■). The health care provider inserts the catheter using local anesthesia or during bladder or vaginal surgery. The catheter may be secured in place with sutures to reinforce the security of the catheter and is then attached to a closed drainage system. The suprapubic catheter may be placed for temporary bladder drainage until the client is able to resume normal voiding (e.g., after urethral, bladder, or vaginal surgery) or it may become a permanent device (e.g., urethral or pelvic trauma).

Care of clients with a suprapubic catheter includes regular assessments of the client's urine, fluid intake, and comfort; maintenance of a patent drainage system; skin care around the insertion site; and periodic clamping of the catheter preparatory to removing it if it is not a permanent appliance. If the catheter is temporary, orders generally include leaving the catheter open to drainage for 48 to 72 hours, then clamping the catheter for 3- to 4-hour periods during the day until the client can void satisfactory amounts. Satisfactory voiding is determined by measuring the client's residual urine after voiding.

Care of the catheter insertion site involves sterile technique. Dressings around the newly placed suprapubic catheter are changed whenever they are soiled with drainage to prevent bacterial growth around the insertion site and reduce the potential for infection. Cleanse with 4×4s with chlorhexidine gluconate and warm water. The area is dressed with a 4×4 and taped in an occlusive fashion (Bullman, 2011). Securing the catheter tube to the abdomen helps to reduce tension at the insertion site. For catheters that have been in place for an extended period, no dressing may be needed and the healed insertion tract enables removal and replacement of the catheter as needed. Formation, however, of a healed insertion tract takes approximately 6 weeks to 6 months to develop. Before that time, the catheter needs to be replaced within 30 minutes if it falls out to prevent the opening from closing over (Bullman, 2011; Winder, 2012). The nurse assesses the insertion area at regular intervals. If pubic hair invades the insertion site, it may be carefully trimmed with scissors. Any redness or discharge at the skin around the insertion site must be reported.

Urinary Diversions

A urinary diversion is the surgical rerouting of urine from the kidneys to a site other than the bladder. Clients with bladder cancer often need a urinary diversion when the bladder must be removed or bypassed. There are two categories of diversions: incontinent and continent.

Incontinent

With incontinent diversions clients have no control over the passage of urine and require the use of an external ostomy appliance to contain the urine. Urinary diversions may or may not involve the removal of the bladder (cystectomy). Examples of incontinent diversions include ureterostomy, nephrostomy, vesicostomy, and ileal conduits. A **ureterostomy** is when one or both of the ureters may be brought directly to the side of the abdomen to form small stomas. This procedure, however, has some disadvantages in that the stomas provide direct access for microorganisms from the skin to the kidneys, the small stomas are difficult to fit with an appliance to collect the urine, and they may narrow, impairing urine drainage. A **nephrostomy** diverts urine from the kidney via a catheter inserted into the renal pelvis to a nephrostomy tube and bag (Figure 48–13 ■). A **vesicostomy** may be formed when the bladder is left intact but voiding through the urethra is not possible (e.g., due to an obstruction or a neurogenic bladder). The ureters remain connected to the bladder, and the bladder wall is surgically attached to an opening in the skin below the navel, forming an opening (stoma) for urinary drainage.

The most common incontinent urinary diversion is the **ileal conduit** or ileal loop (Figure 48–14 ■). In this procedure, a segment of the ileum is removed and the intestinal ends are reattached. One end of the portion removed is closed with sutures to create a pouch, and the other end is brought out through the abdominal wall to create a stoma. The ureters are implanted into the ileal pouch. The ileal stoma is more readily fitted with an appliance than ureterostomies because of its larger size. The mucous membrane lining of the ileum also provides some protection from ascending infection. Urine drains continuously from the ileal pouch.

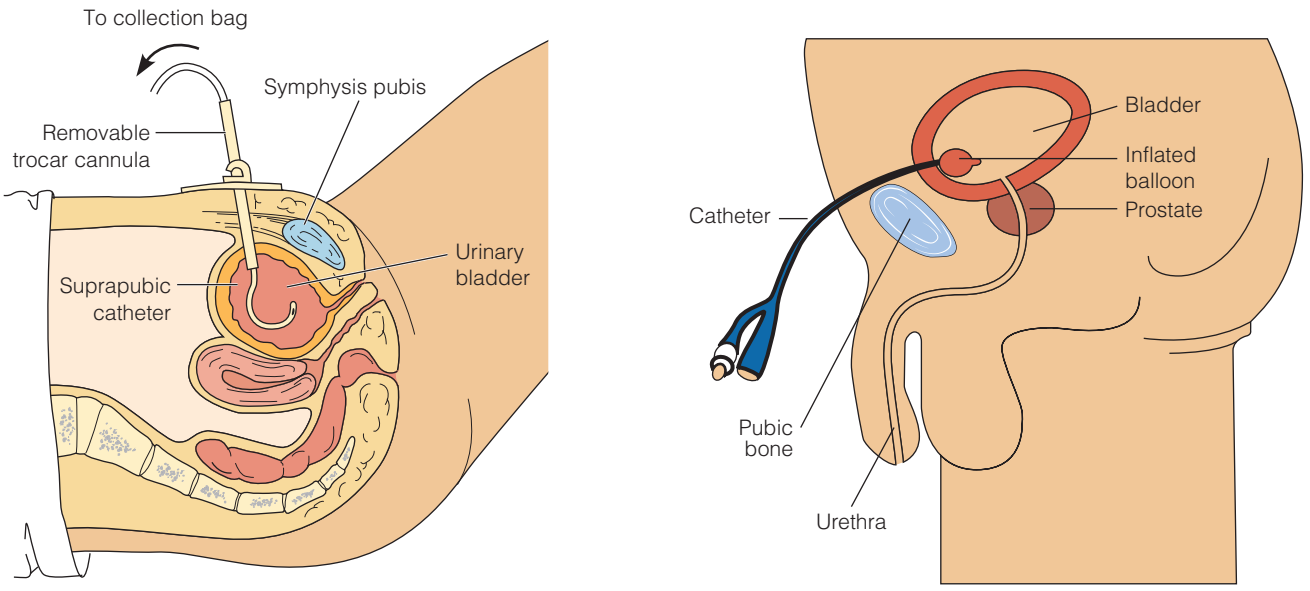


Figure 48–12 ■ A suprapubic catheter in place: *A*, using a pigtail loop; *B*, using a balloon to keep catheter in place.

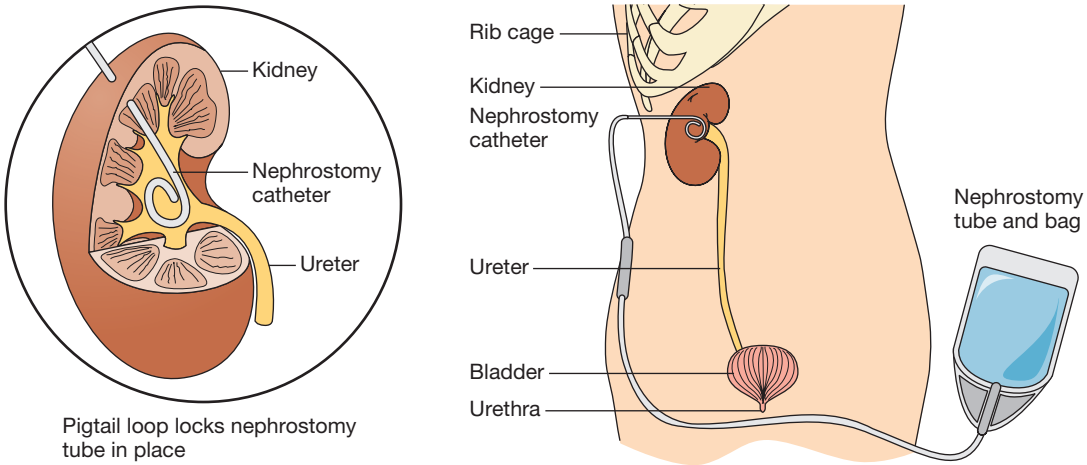


Figure 48–13 ■ A nephrostomy.

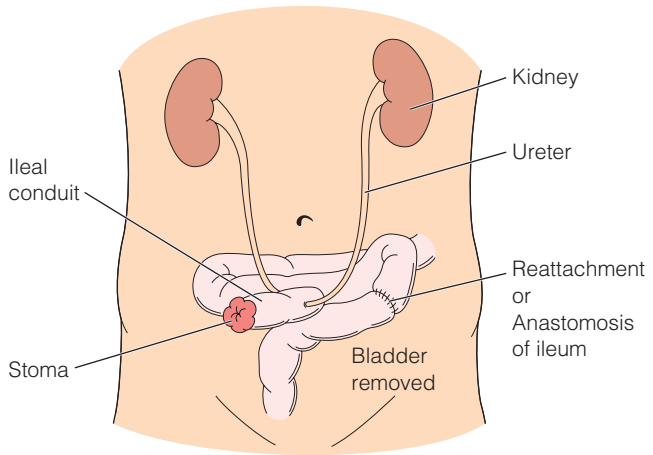


Figure 48–14 ■ An incontinent urinary diversion (ileal conduit).

Continent

Continent urinary diversion involves creation of a mechanism that allows the client to control the passage of urine, either by intermittent catheterization of the internal reservoir (e.g., Kock pouch) or by creating a neobladder or internal pouch.

The Kock (pronounced "coke") pouch, or continent ileal bladder conduit, also uses a portion of the ileum to form a reservoir for urine (Figure 48–15 ■). In this procedure, nipple valves are formed by doubling the tissue backward into the reservoir where the pouch connects to the skin and the ureters connect to the pouch. These valves close as the pouch fills with urine, preventing leakage and reflux of urine back toward the kidneys. The client empties the pouch by inserting a clean catheter approximately every 2 to 3 hours at first and increases to every 5 to 6 hours as the pouch expands. Over time, the pouch can expand to between 600 and 1,000 mL (Avent, 2012, p. 51). Between catheterizations, a small dressing is worn to protect the stoma and clothing.

A continent diversion with a neobladder involves replacing a diseased or damaged bladder with a piece of ileum and colon that is located in the same location as the bladder that was removed (Avent, 2012). A pouch or new bladder is created. The ureters are sutured to one end of the new pouch/bladder and this new bladder is then sutured to the functional urethra to facilitate client voiding control (Figure 48–16 ■). The client will need to relearn how to void. Voiding occurs when the urethral sphincter muscle relaxes and abdominal straining occurs to put pressure on the pouch.

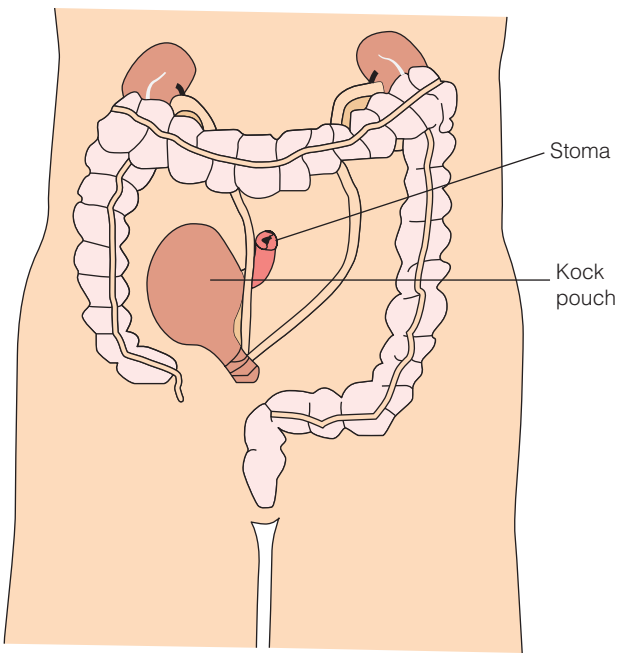


Figure 48–15 ■ The Kock pouch—a continent urinary diversion.

When caring for clients with a urinary diversion, the nurse must accurately assess intake and output; note any changes in urine color, odor, or clarity (mucous shreds are commonly seen in the urine of clients with an ileal diversion); and frequently assess the condition of the stoma and surrounding skin. Clients who must wear a urine collection appliance are at risk for impaired skin integrity because of irritation by urine. Well-fitting appliances are vital. The nurse should consult with the wound ostomy continence nurse (WOCN) to identify strategies for management of stoma and peristomal problems when selecting the most appropriate appliance for the client's needs. The steps of changing a urostomy appliance are similar to those described in the procedure for changing a bowel diversion appliance (see Chapter 49 ∞). However, there are some differences, including the following: Incontinent urinary diversions drain continually. As a result, some type of wicking material (e.g., rolled dry gauze pad or tampon) can be placed over the stoma to absorb the urine and keep the skin dry throughout the measurement and change of the ostomy appliance (Avent, 2012). Immediately following surgery, ureteral stents may be present and protruding from the stoma. These remain in place for 10 to 14 days postop

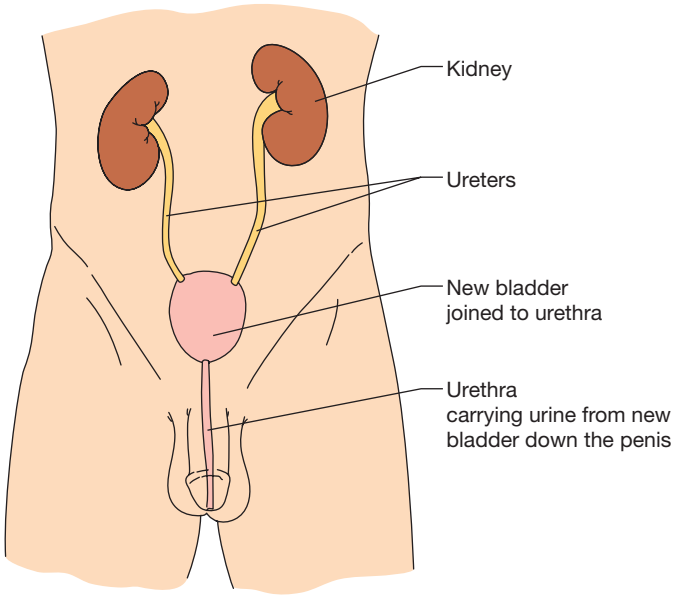


Figure 48–16 ■ A neobladder.

and are removed by either the surgeon or the WOCN, depending on institutional protocol. Ureteral stents are used to maintain the patency of ureters at the anastomotic sites.

Clients with urinary diversions may experience body image and sexuality problems and may require assistance in coping with these changes and managing the stoma. Most clients are able to resume their normal activities and lifestyle.

Evaluating

Using the overall goals and desired outcomes identified in the planning stage, the nurse collects data to evaluate the effectiveness of nursing activities. If the desired outcomes are not achieved, explore the reasons before modifying the care plan. For example, if the outcome "Remains dry between voidings and at night" is not met, examples of questions that need to be considered include:

- What is the client's perception of the problem?
- Does the client understand and comply with the health care instructions provided?
- Is access to toilet facilities a problem?
- Can the client manipulate clothing for toileting? Can adjustments be made to allow easier disrobing?
- Are scheduled toileting times appropriate?
- Is there adequate transition lighting for night-time toileting?
- Are mobility aids such as a walker, elevated toilet seat, or grab bar needed? If currently used, are they appropriate or adequate?
- Is the client performing pelvic floor muscle exercises appropriately as scheduled?
- Is the client's fluid intake adequate? Does the timing of fluid intake need to be adjusted (e.g., restricted after dinner)?
- Is the client restricting caffeine, citrus juice, carbonated beverages, and artificial sweetener intake?
- Is the client taking a diuretic? If so, when is the medication taken? Do the times need to be adjusted (e.g., taking second dose no later than 4 PM)?
- Should continence aids such as a condom catheter or absorbent pads be used?

NURSING CARE PLAN Urinary Elimination

Assessment Data	Nursing Diagnosis	Desired Outcomes*
Nursing Assessment Mr. John Baker is a 68-year-old shopkeeper who was admitted to the hospital with urinary retention, hematuria, and fever. The admitting nurse gathers the following information when taking a nursing history. Mr. Baker states he has noticed urinary frequency during the day for the past 2 weeks, and that he doesn't feel he has emptied his bladder after urinating. He also has to get up two or three times during the night to urinate. During the past few days, he has had difficulty starting urination and dribbles afterward. He verbalizes the embarrassment his urinary problems cause in his dealings with the public. Mr. Baker is concerned about the cause of this urinary problem. He is diagnosed with benign prostatic hypertrophy (BPH) and referred to a urologist who suggests a transurethral resection of the prostate (TURP) in several months. He is placed on antibiotic therapy.	*Impaired Urinary Elimination* (dysfunction in urine elimination) related to bladder neck obstruction by enlarged prostate gland (as evidenced by dysuria, frequency, nocturia, dribbling, hesitancy, and bladder distention)	**Urinary Continence [0502]** sometimes demonstrated as evidenced by: • Able to start and stop stream • Empties bladder completely **Knowledge: Treatment Regimen [1813]** as evidenced by substantial knowledge of: • Self-care responsibilities for ongoing treatment • Self-monitoring techniques

Physical Examination	Diagnostic Data
Height: 185.4 cm (6′2″) Weight: 85.7 kg (189 lb) Temperature: 38.1°C (100.6°F) Pulse: 88 beats/min Respirations: 20/min Blood pressure: 146/86 mmHg Catheterization for urinary retention yielded 300 mL amber urine, Foley left in place for 2 days	CBC normal; urinalysis: amber, clear, pH 6.5, specific gravity 1.025, negative for glucose, protein, ketone, RBCs, and bacteria; IVP: evidence of enlarged prostate gland

NURSING CARE PLAN Urinary Elimination—*continued*

Nursing Interventions*/Selected Activities	Rationale
URINARY INCONTINENCE CARE [0610]	
Monitor urinary elimination, including consistency, odor, volume, and color.	*These parameters help determine adequacy of urinary tract function.*
Help the client select appropriate incontinence garment or pad for short-term management while more definitive treatment is designed.	*Appropriate undergarments can help diminish the embarrassing aspects of urinary incontinence.*
Instruct Mr. Baker to limit fluids for 2 to 3 hours before bedtime.	*Decreased fluid intake several hours before bedtime will decrease the incidence of urinary retention and overflow incontinence, and promote rest.*
Instruct him to drink a minimum of 1,500 mL (six 8-ounce glasses) fluids per day.	*Increased fluids during the day will increase urinary output and discourage bacterial growth.*
Limit ingestion of bladder irritants (e.g., colas, coffee, tea, and chocolate).	*Alcohol, coffee, and tea have a natural diuretic effect and are bladder irritants.*
URINARY RETENTION CARE [0620]	
Instruct Mr. Baker or a family member to record urinary output.	*Serves as an indicator of urinary tract and renal function and of fluid balance.*
Monitor degree of bladder distention by palpation and percussion and/or bladder scanner.	*An enlarged prostate compresses the urethra so that urine is retained. Checking for bladder distention provides information about bladder emptying and potential residual urine.*
Implement intermittent catheterization, as appropriate.	*Helps maintain tonicity of the bladder muscle by preventing overdistention and providing for complete emptying.*
Provide enough time for bladder emptying (10 minutes).	*In addition to the effect of an enlarged prostate on the bladder, stress or anxiety can inhibit relaxation of the urinary sphincter. Sufficient time should be allowed for micturition.*
Instruct the client in ways to avoid constipation or stool impaction.	*Impacted stool may place pressure on the bladder outlet, causing urinary retention.*
TEACHING: DISEASE PROCESS [5602]	
Appraise Mr. Baker's current level of knowledge about benign prostatic hypertrophy.	*Assessing the client's knowledge will provide a foundation for building a teaching plan based on his present understanding of his condition.*
Explain the pathophysiology of the disease and how it relates to urinary anatomy and function.	*In this case, urinary retention and overflow incontinence are caused by obstruction of the bladder neck by an enlarged prostate gland.*
Describe the rationale behind management, therapy, and treatment recommendations.	*Adequate information about treatment options is important to diminish anxiety, promote compliance, and enhance decision making.*
Instruct Mr. Baker on which signs and symptoms to report to the health care provider (e.g., burning on urination, hematuria, oliguria).	*In the individual with prostatic hypertrophy, urinary retention and an overdistended bladder reduce blood flow to the bladder wall, making it more susceptible to infection from bacterial growth. Monitoring for these manifestations of UTI is essential to prevent urosepsis.*

EVALUATION

Outcomes partially met. Following removal of the Foley catheter, Mr. Baker reported continued difficulty initiating a urinary stream but experienced less dribbling and nocturia. He and his wife selected an undergarment that was acceptable to Mr. Baker and he reports that he feels more confident. Intermittent catheterization not indicated. Intake is approximately 200 mL in excess of output. He is able to discuss the correlation between his enlarged prostate and urinary difficulties. A transurethral resection of the prostate is scheduled in 2 weeks.

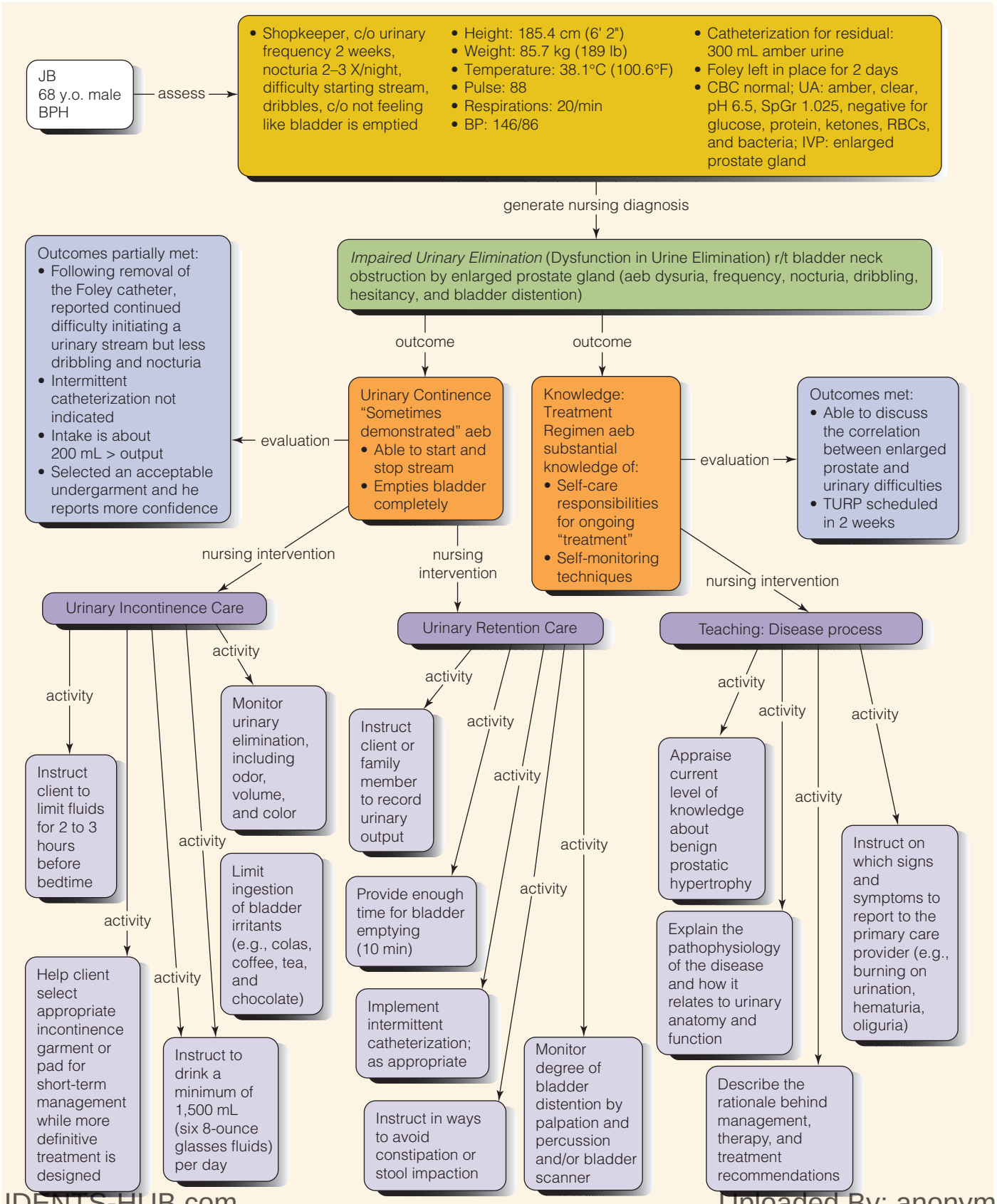
*The NOC # for desired outcomes and the NIC # for nursing interventions are listed in brackets following the appropriate outcome or intervention. Outcomes, interventions, and activities selected are only a sample of those suggested by NOC and NIC and should be further individualized for each client.

APPLYING CRITICAL THINKING

1. Considering Mr. Baker's history and assessment data, what other physical conditions could explain his symptoms?
2. The primary care provider has recommended surgery. What assumptions will the nurse need to validate in helping prepare Mr. and Mrs. Baker for this surgery?
3. It does not appear that other alternatives have been considered. Why might this be so?
4. Incontinence can lead to client decisions to limit social interactions. What would be an appropriate response if Mr. Baker states that he will just stay home until he has his surgery?

See Critical Thinking Possibilities on student resource website.

CONCEPT MAP
Urinary Elimination



Chapter 48 Review

CHAPTER HIGHLIGHTS

- Urinary elimination depends on normal functioning of the upper urinary tract's kidneys and ureters and the lower urinary tract's urinary bladder, urethra, and pelvic floor.
- Urine is formed in the nephron, the functional unit of the kidney, through a process of filtration, reabsorption, and secretion. Hormones such as antidiuretic hormone (ADH) and aldosterone affect the reabsorption of sodium and water, thus affecting the amount of urine formed.
- The normal process of urination is stimulated when sufficient urine collects in the bladder to stimulate stretch receptors. Impulses from stretch receptors are transmitted to the spinal cord and the brain, causing relaxation of the internal sphincter (unconscious control) and, if appropriate, relaxation of the external sphincter (conscious control).
- In the adult, urination generally occurs after 250 to 450 mL of urine has collected in the bladder.
- Many factors influence a person's urinary elimination, including growth and development, psychosocial factors, fluid intake, medications, muscle tone, various diseases and conditions, and surgical and diagnostic procedures.
- Alterations in urine production and elimination include polyuria, oliguria, anuria, frequency, nocturia, urgency, dysuria, enuresis, incontinence, and retention. Each may have various influencing and associated factors that need to be identified.
- Millions of Americans, mostly women, suffer from urinary incontinence (UI). UI can have a significant impact on the client's quality of life, creating physical problems, such as skin breakdown and also psychosocial problems, such as social isolation and withdrawal, less positive relationships with others, poorer perceived health, negative effect on sexual function and intimacy, depression, and a barrier to physical and everyday activities.
- The four main types of UI are stress urinary incontinence, urge urinary incontinence, mixed urinary incontinence, and overflow incontinence.
- Nurses, as part of their clinical practice, should assess all clients for UI. Assessment of a client's urinary function includes (a) a nursing history that identifies voiding patterns, recent changes, past and current problems with urination, and factors influencing the elimination pattern; (b) a physical assessment of the genitourinary system; (c) inspection of the urine for amount, color, clarity, and odor; and, if indicated, (d) testing of urine for specific gravity, pH, and the presence of glucose, ketone bodies, protein, and occult blood.
- Many NANDA-approved nursing diagnoses may apply to clients with altered urinary elimination patterns, for example, *Functional Urinary Incontinence*, *Urinary Retention*, and related diagnoses such as *Risk for Infection.*
- Goals for the client with problems with urinary elimination include maintaining or restoring normal voiding patterns and preventing associated risks such as skin breakdown.
- In planning for home care, the nurse considers the client's needs for teaching and assistance in the home.
- Interventions include assisting the client to maintain adequate fluid intake and normal voiding patterns, and assisting with toileting.
- The most common cause of UTI is bacteria. Women in particular are prone to UTIs because of their short urethras.
- Urinary catheterization is frequently required for clients with urinary retention but is only performed when all other measures to facilitate voiding fail. Sterile technique is essential to prevent urinary infections.
- It is well documented that the risk to the client of developing a CAUTI correlates to the duration of the catheter being in place.
- Care of clients with indwelling catheters is directed toward assessing the necessity for the catheter, preventing infection of the urinary tract, and encouraging urinary flow through the drainage system.
- Clients with urinary retention may be taught to perform clean intermittent self-catheterization to enhance their independence, reduce the risk of infection, and eliminate incontinence.
- Bladder or catheter irrigations may be used to apply medication to bladder walls or maintain catheter patency.
- A urinary diversion is the surgical rerouting of urine from the kidneys to a site other than the bladder. There are two categories of diversions: incontinent and continent.

TEST YOUR KNOWLEDGE

1. The nurse recognizes that urinary elimination changes may occur even in healthy older adults because of which of the following?
   1. The bladder distends and its capacity increases.
   2. Older adults ignore the need to void.
   3. Urine becomes more concentrated.
   4. The amount of urine retained after voiding increases.

2. During assessment of the client with urinary incontinence, the nurse is most likely to assess for which of the following? Select all that apply.
   1. Perineal skin irritation
   2. Fluid intake of less than 1,500 mL/day
   3. History of antihistamine intake
   4. History of frequent urinary tract infections
   5. A fecal impaction

3. Which action represents the appropriate nursing management of a client wearing a condom catheter?
   1. Ensure that the tip of the penis fits snugly against the end of the condom.
   2. Check the penis for adequate circulation 30 minutes after applying.
   3. Change the condom every 8 hours.
   4. Tape the collecting tubing to the lower abdomen.

4. The catheter slips into the vagina during a straight catheterization of a female client. The nurse does which action?
   1. Leaves the catheter in place and gets a new sterile catheter.
   2. Leaves the catheter in place and asks another nurse to attempt the procedure.
   3. Removes the catheter and redirects it to the urinary meatus.
   4. Removes the catheter, wipes it with a sterile gauze, and redirects it to the urinary meatus.

5. Which statement indicates a need for further teaching of the home care client with a long-term indwelling catheter?
   1. "I will keep the collecting bag below the level of the bladder at all times."
   2. "Intake of cranberry juice may help decrease the risk of infection."
   3. "Soaking in a warm tub bath may ease the irritation associated with the catheter."
   4. "I should use clean technique when emptying the collecting bag."
6. During shift report, the nurse learns that an older female client is unable to maintain continence after she senses the urge to void and becomes incontinent on the way to the bathroom. Which nursing diagnosis is most appropriate?
   1. *Stress Urinary Incontinence*
   2. *Reflex Urinary Incontinence*
   3. *Functional Urinary Incontinence*
   4. *Urge Urinary Incontinence*
7. A female client has a urinary tract infection (UTI). Which teaching points by the nurse would be helpful to the client? Select all that apply.
   1. Limit fluids to avoid the burning sensation on urination.
   2. Review symptoms of UTI with the client.
   3. Wipe the perineal area from back to front.
   4. Wear cotton underclothes.
   5. Take baths rather than showers.
8. The nurse will need to assess the client's performance of clean intermittent self-catheterization (CISC) for a client with which urinary diversion?
   1. Ileal conduit
   2. Kock pouch
   3. Neobladder
   4. Vesicostomy
9. Which focus is the nurse most likely to teach for a client with a flaccid bladder?
   1. Habit training: Attempt voiding at specific time periods.
   2. Bladder training: Delay voiding according to a preschedule timetable.
   3. Credé's maneuver: Apply gentle manual pressure to the lower abdomen.
   4. Kegel exercises: Contract the pelvic muscles.
10. Which of the following behaviors indicates that the client on a bladder training program has met the expected outcomes? Select all that apply.
    1. Voids each time there is an urge.
    2. Practices slow, deep breathing until the urge decreases.
    3. Uses adult diapers, for "just in case."
    4. Drinks citrus juices and carbonated beverages.
    5. Performs pelvic muscle exercises.

See Answers to Test Your Knowledge in Appendix A.

READINGS AND REFERENCES

Suggested Readings

Magers, T. L. (2013). Using evidence-based practice to reduce catheter-associated urinary tract infections. *American Journal of Nursing*, *113*(6), 34–21. doi:10.1097/01.NAJ.0000430923.07539.a7

This article reports on an evidence-based project (EBP) in which a seven-step approach to EBP was used to reduce the incidence of catheter-associated urinary tract infection among adult clients in a long-term acute care hospital by reducing the duration of catheterization.

Scemons, D. (2013). Urinary incontinence in adults. *Nursing*, *43*(11), 52–60. doi:10.1097/01.NURSE.0000435202.96023.d6

This article reviews bladder function and discusses the four main types of UI in adults. The client assessment and nursing interventions presented are based on the type of UI: stress, urge, mixed, and overflow.

Related Research

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