Spinal Cord Injury Manual

A Publication of the Regional Spinal Cord Injury Center of Delaware Valley

The Regional Spinal Cord Injury Center of Delaware Valley provides a comprehensive program of patient care, community education, and research. It is a federally designated program of Thomas Jefferson University and its affiliated institutions of Thomas Jefferson University Hospital and Magee Rehabilitation Hospital.

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Spinal Cord Injury
Patient-Family Teaching Manual

A Publication of the
Regional Spinal Cord Injury Center
of Delaware Valley

Researched and prepared by the clinical personnel
of Thomas Jefferson University Hospital and
Magee Rehabilitation Hospital

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Dedication

The Handbook Committee of the Regional SCI Center of the Delaware Valley gratefully acknowledges the hard work and dedication of all who contributed to this manual.

Credits

The Handbook Committee of the Regional SCI Center of the Delaware Valley would like to acknowledge the assistance of all of the people in the Center who have helped to develop this Handbook:

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Bladder

Bladder

Introduction

Your bladder and urinary system play a very important part in keeping you healthy by acting like a "filter" and getting rid of the waste products from food and fluid that you have eaten and absorbed. After you have had a spinal cord injury, you often lose your ability to control urination. You may not be able to feel that your bladder is full, and if you can feel it, you may not be able to empty it.

It is important to note here that the changes that occur in your bladder will be unique to you. Although there are similarities, no two people with spinal cord injuries will have the exact same Bladder Management Program or the same response to their program. There may be some slight differences based on your unique experience; however, the function and the change of the function in your bladder after spinal cord injury is important for you to understand and master to maintain your health after your injury.

The Purpose and Parts of the Urinary System

As mentioned above, the purpose of the urinary system is threefold, it:

1. Filters waste products from your blood.
2. Produces urine.
3. Passes the urine from your body.

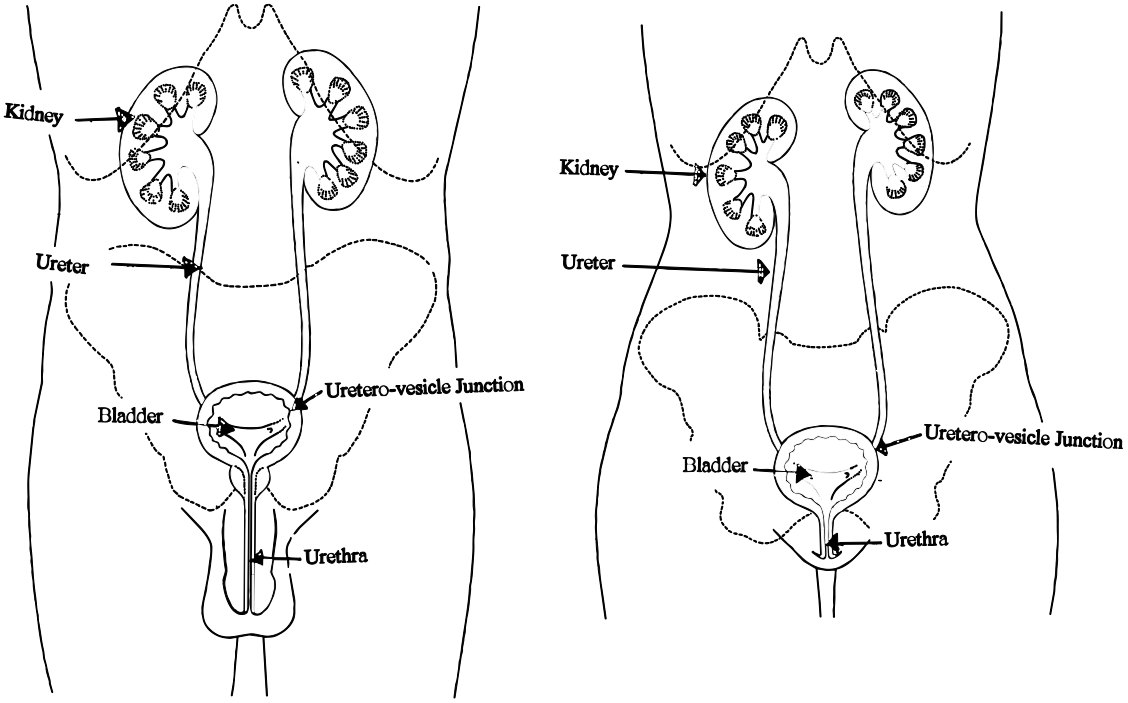
The major parts of your urinary system are:

1. **Kidneys** (There are two — one on each side of the body.) They filter the waste products from the blood and produce urine. They also maintain essential body substances (like chemicals and minerals) at a constant level.
2. **Ureters** (There are two — one on each side of the body.) They are long tubes going from the kidneys to the bladder. Urine made by the kidneys flows through the ureters to the bladder.
3. **Uretero-vesicle junction** – The place where the ureters enter the bladder. A valve is there to help keep urine from flowing back to the kidneys from the bladder. (This is called *reflux*.)
4. **Bladder** – A hollow muscular organ (like a ball) where your urine is stored. It senses when it is full and

contracts to push urine down through the urethra and sphincters and out of the body.

5. **Urethra** – The tube that goes from the bottom of the bladder to the outside of the body, draining the urine out. The length of this tube is approximately eight inches in males and four inches in females.
6. **Sphincter** – (There are two — an *internal sphincter* and an *external sphincter*) It is a muscle that surrounds the bladder opening and squeezes it causing it to close.
    - The internal sphincter is located right at the base of the bladder, around the urethra. It usually keeps the base of the bladder closed so that it can collect urine. This sphincter is not under your voluntary control.
    - The external sphincter is located around the urethra closer to the opening. It allows urine to leave the body. This sphincter was under your voluntary control before your spinal cord injury.

The Urinary System: Male and Female



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The Process of Urination: What Usually Happens

The urinary system is supplied by two sets of nerves — one set controls the bladder and the other set of nerves control the sphincters. In order for normal urination to occur, both sets of nerves must function normally.

There is a pathway that goes from the brain to the bladder — through the spinal cord — that normally allows you to have control over when you urinate.

As mentioned before, your kidneys "filter" and remove waste products from your blood, which then produces urine. This is why any damage to your kidneys could become life threatening. The urine travels down from the kidneys through the ureters to the bladder to be stored. Where the ureters enter the bladder, there is a valve that prevents urine from going back up into the kidneys. This is called *reflux*, and it can cause massive kidney infection and failure.

As urine fills the bladder, it stretches and creates the feeling of bladder fullness or pressure. This feeling of fullness is sent to the spinal cord, then up to the brain. Before your spinal cord injury, you usually control this feeling by controlling the external urinary sphincter until you decide that it is the right time and place to empty your bladder. When you are ready to urinate, a message comes from the brain down through the spinal cord to relax the sphincter.

Normally to urinate, your bladder muscles contract, you contract your abdominal muscles, the internal sphincter relaxes automatically and you voluntarily relax your external sphincter and your bladder empties completely.

Changes That Occur in Your Urinary System After a Spinal Cord Injury

When the spinal cord is injured, the communication between the brain, the bladder and the sphincters is disrupted. Your kidneys continue to work, filtering waste, making urine, and filling the bladder. However now when the bladder becomes full and the message is sent to the spinal cord then to the brain, the message is blocked.

After a spinal cord injury, you usually cannot feel the sensation of bladder fullness, nor can you feel or control the external sphincter. Since the message cannot get through, the brain is not able to start urination. Or, if some urine were to come out by reflex, your bladder may not empty completely. In order for your bladder to work correctly, you need the coordination between the bladder contractions and the relaxation of the sphincters to allow your urine to drain out completely.

What Happens Immediately After Injury

Spinal Shock Bladder Dysfunction

Immediately after a spinal cord injury, you may experience a temporary period of *spinal shock* during which all of your spinal reflexes may be absent (or flaccid). The length of time your bladder is like this may vary. After this shock or flaccid phase, it is the level of your spinal cord injury, and whether or not your injury is complete or incomplete, that will determine how your urinary system will function in the future.

There are a couple of ways your urinary system may function after your injury. As mentioned above, how it functions depends on where the damage is located in your spinal cord. In the spinal cord, the sacral levels S2-3-4 are responsible for bladder function. They are known as the *sacral reflex arc* also.

With normal bladder function, as the bladder fills, it sends messages to the spinal cord through the sacral reflex arc, then to the brain. When the time and place are appropriate, your brain usually allows you to urinate by sending a message back down the spinal cord through the sacral reflex arc to the bladder. This allows your bladder to contract, the sphincters to open and the bladder to empty.

Areflexic / Flaccid Neurogenic Bladder

In spinal cord injuries below the T12 level, the sacral / reflex arc is usually damaged and the bladder will remain flaccid. This can also occur in a complete cauda equina injury. In addition to the connection between the brain and the bladder being disrupted, the reflex "loop" is damaged also, so in this case, the bladder loses its ability to empty automatically. Your bladder is flaccid and the walls lose their normal tone. As a result, your bladder may overfill with urine but it may or may not create enough pressure to open the sphincter. Or, it remains constantly full and urine just leaks out of the sphincters. This is called *over distention* and the urine, which has bacteria in it, can cause a life-threatening bladder or kidney infection. This is called a *areflexic neurogenic bladder*. Methods used to manage this type of bladder include: an IC Program, urinary diversions and indwelling Foley catheters.

Reflex / Spastic Neurogenic Bladder

If the reflex arc is not injured (usually in spinal cord injuries above the T12 level), your bladder may develop into a reflex bladder. Messages will continue to travel between the bladder and the S2-3-4 reflex segments of the spinal cord and back to the bladder in a large reflex "loop." However, the connection

between the brain and the bladder, allowing for the feeling of bladder fullness and the ability to control urination is lost. This type of bladder is often unreliable and unpredictable as to when it will empty and it may only empty small amounts of urine. This results in an automatic, or reflex emptying of the bladder. This is also called a *reflex neurogenic bladder*. Methods used to empty this type of bladder may include using an external condom catheter attached to a collection bag, an intermittent catheterization program or indwelling foley catheters.

Bladder Sphincter Dyssynergia

Another important factor with neurogenic bladder dysfunction that was mentioned before is the fact that often the internal and external sphincters will not relax enough to allow the urine to flow, resulting in incomplete emptying of the bladder. As a matter of fact, the sphincters often become tighter or more spastic. This is an abnormal reflex called *detrusor-sphincter dyssynergia* or *bladder-sphincter dyssynergia*. This tightness can cause the urine in the bladder to back-up into the ureters and then into the kidneys, which can cause life-threatening renal failure. For this reason, "triggering" urination or manual techniques should **not** be used if dyssynergia is present. You will under go a variety of bladder testing to evaluate your bladder function and test for dyssynergia in order to help identify the best bladder management program for you.

It is important to keep in mind that the changes in bladder function that have happened are unique to you. No two people are exactly alike nor do their bladders respond in exactly the same way. As you recover, you and your caregivers will be taught different methods to remove the urine from your bladder to remain healthy. Remember, it takes a tremendous amount of patience and fine-tuning in order for you and your physician to find the bladder management program that is right for you.

What a Bladder Management Program Is and What It Will Do for You

A bladder management program addresses the specific bladder problems that you may experience after your spinal cord injury and attempts to help you regain some type of control over your bladder function. A bladder management program should help you to:

- Maintain the health of your upper urinary tract, especially the ureters and kidneys.
- Minimize infection and other complications.

- Empty your bladder regularly and completely at low pressures.
- Avoid bladder stretching (over-distension).
- Provide adequate urine storage.
- Achieve social and vocational acceptability and adaptability.

The primary purpose of a bladder management program is to help you be in control of elimination. Your bladder training program will be successful when you are able to use specific methods to empty your bladder without "accidents." Please understand that not all of these goals can be met all of the time. Your bladder management program should enable you to meet as many goals as possible without controlling your life.

Bladder Testing

As soon as possible after your injury, you will have a series of tests done that will show how your bladder is functioning and the best way to manage it. This information is needed to help your doctor prescribe the proper bladder management programs and medications for you. These tests may include one or more of the following:

Urinalysis

This is a test that looks at your urine, analyzes it and gives information about the way your kidneys are working. The urinalysis tells if there are any white blood cells, protein, sugar, blood or bacteria in the urine that are not there usually. It also tells the color of the urine (it should be clear) and whether it is acidic or alkaline (called the *Ph*) because the bacteria do not grow well in acidic urine.

Urine Culture and Sensitivity

This test is done by collecting a sterile urine sample from a catheter. The urine is then looked at in the laboratory for the amount and type of bacterial growth that usually occurs with an infection. When the bacteria grow, laboratory assistants then test to see which antibiotic(s) can kill it, which is called *sensitivity*.

BUN (Blood Urea Nitrogen) and Creatinine

These tests are done by taking a sample of your blood and checking for the levels of urea nitrogen and creatinine. The

levels of these in the blood give information on whether or not your kidneys are working normally.

24-Hour Urine for Creatinine Clearance

In this test, all of the urine you produce in a 24-hour period is collected in a large plastic jug. At the end of the 24-hour collection period, a blood sample is collected. Tests are then done to determine the amount of creatinine in both samples. The comparison of these two amounts tells how well your kidneys are functioning.

Cystometrogram (Urodynamics)

This test is done to measure the way the bladder contracts when it fills and empties. Before this test is done, a urine culture and sensitivity test should be done and if there is an infection, antibiotics should be given to prevent the possibility of a kidney infection. (Often, antibiotics are given routinely before doing this test.)

In this test, either fluid or a gas is inserted slowly through a catheter and into your bladder. You are asked to let the technician know if you can feel your bladder filling. You may be asked to try to empty your bladder if you can. The amount emptied is recorded and compared to the amount put into your bladder. This test can also measure the pressure of the sphincters in the bladder neck (called the UPP or *Urethral Pressure Profile*), bladder storage pressures and whether or not the sphincter pressure creates the problem called *bladder-sphincter dyssynergia*.

Cystoscopy

This test is done to look inside at the bladder, ureters and urethra to see if they are normal or if any stones or tumors are present. To do this test a slender, flexible instrument with a light on the end of it (called a *scope*) is inserted into the bladder through the urethra the way a catheter is inserted. If there are any stones, they may be able to be crushed and removed through the scope.

KUB (Kidney, Ureter, Bladder) X-rays

This is an x-ray test that is done to show the size, shape, location and possible malformations of the kidneys and bladder. Also, this test can show if there are stones in your urinary system. This test can show abnormal collections of gas

in the gastrointestinal tract that may be a necessary part of your bowel program.

Cystogram

This test is an x-ray study in which a Foley catheter is inserted and a clear dye is inserted into the bladder while x-ray pictures are obtained. This provides information about the size, shape, capacity and whether urinary reflux may be occurring. Also, it may be used to see if bladder stones (called *calculi*) are present.

IVP (Intravenous Pyelogram)

This test combines a contrast (iodine) dye with x-rays to obtain a better picture of the size, shape, functioning and any abnormalities of the kidneys, ureters and bladder. In this test the dye is injected into your vein that will then be filtered out by your kidneys. X-rays are taken throughout the procedure showing the process and the amount of time it takes for the dye to be filtered out. (Your bowels should be empty for the test). This is a good measure of your urinary function. Please make sure that you let your doctor or nurse know if you are allergic to shellfish or iodine.

Renal Scan and Ultrasound

The renal scan is another test that tells about the function of your kidneys. This test does not use an iodine dye. However, it does use a radioactive material that helps the kidneys to be seen. A scan is then taken to show kidney function. The ultrasound is done using sound waves that can then provide a picture of your kidneys and bladder as they are working. This test is safe to do if you have an allergy to the IVP dye or if you already have problems with your kidney function.

Some of these tests may be done more than once during your hospitalization. This is individual and depends on how your bladder begins to work after your spinal cord injury.

It is important to understand that caring for your urinary system by doing your bladder management program is something that you will have to do for the rest of your life. After you are discharged, it is highly recommended that some of these tests be repeated on a yearly basis (or more frequently). These tests can be scheduled for you as part of your annual check-up in the Spinal Cord Injury Follow-up Clinic.

Bladder Retraining

Bladder retraining describes the techniques used to help you control your bladder. As mentioned previously, the goal of bladder retraining is to develop a healthy and manageable way for you to empty your bladder.

There are many things that are looked at and considered in order to decide which techniques are the best to help you control and manage your bladder after your spinal cord injury including:

- Whether or not you have any sensation of bladder fullness or the ability to control urination on your own.
- Your or your caregiver's ability to catheterize you.
- Your lifestyle and preferences.

The techniques used for bladder management programs may include the use of one or more of the following:

- Intermittent catheterization.
- Spontaneous "trigger" voiding with or without the use of an external collecting device.
- Indwelling Foley catheter.
- Surgical interventions.

Initially, after your injury, you will probably have an indwelling Foley catheter. This allows you to be able to have large amounts of fluids through IVs and by mouth, which is important if you have a fever, thick respiratory secretions and right before and after surgery. Other bladder techniques cannot be started until you are medically stable and your fluid intake can be limited.

Different Types of Bladder Management Programs

Intermittent Catheterization (IC) Program

What It Is and Why It Is Important

An Intermittent Catheterization Program (or ICP) is one type of Bladder Management Program. In this program, your fluid intake is limited and the bladder drained by inserting a catheter into the bladder at certain times. The catheter is then removed. This program does not "make" the bladder work. It does, however, simulate the filling and emptying of normal bladder function. This type of program is almost always used to empty an areflexic bladder. However, it may be used to initially drain a reflex or spastic bladder. This helps to keep the bladder and kidneys healthy while your bladder is recovering after the injury.

The goals of an Intermittent Catheterization Program are to:

- Keep urine volumes in the bladder low.
- Have the bladder fill and empty as before.
- Reduce the chance of infection by not allowing urine or a catheter to remain in the bladder (if possible).
- Maintain the muscle tone in the bladder.

Getting Started

Fluid Restriction

The first step is to limit your fluids to 2000 cc (64 oz.) or less per day. Initially, this amount of fluid is divided into a certain amount for breakfast, lunch, dinner and "in-between." Some people may feel this amount is too much, while others feel it is not enough. This amount of fluid is just enough to keep the bladder healthy and assists with the pattern of filling and emptying.

Intake and Output

During the time you are on this program, it is important that you and your caregivers record all of the fluids you take in and all of the fluid you put out. Generally, the intake-output (I and O) volumes should be similar or "balance" over each 24-hour period. This 24-hour pattern is monitored to identify any potential problems.

Catheterization

At first, you will be catheterized every four hours around the clock. A straight catheter is inserted into the bladder, through the urethra and the urine is drained out. This Intermittent Catheterization Program is then continued until your bladder empties well on its own.

Depending on your level of injury and your individual bladder recovery (as identified by bladder testing), you may be able to use other techniques to maximize a reflexive neurogenic bladder. Once ICP is started, your caregivers will start tapping on your bladder before catheterizing you. This is called *"triggering" a void* or trying to get your bladder to empty by reflex.

If your bladder were to begin to "trigger" and release urine, you may then move to reflexive bladder techniques. (Usually your physician will order a CMG test to help him or her decide). If

not, your bladder could still be emptied on a regular basis with catheterization based on bladder scan results. Your physician may suggest using other techniques also.

If your bladder were to release urine, a catheter would be inserted as soon as possible afterward to measure the amount left in the bladder. (This is called *residual urine*.) Ideally, there should be little to no urine left in the bladder.

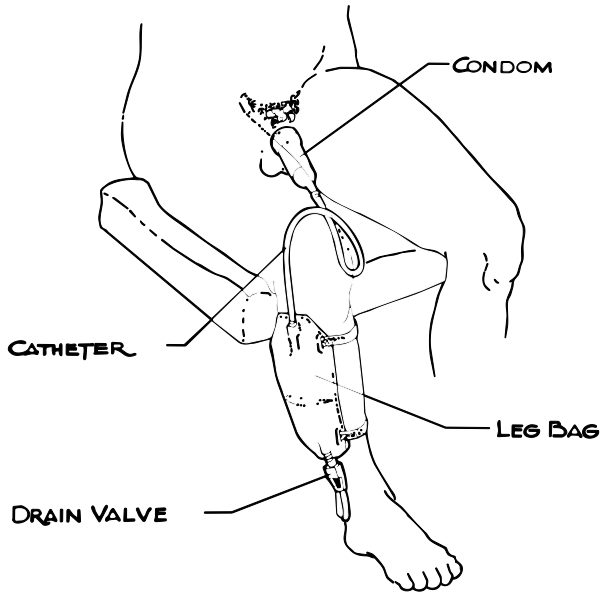
Depending on the amount of urine obtained with the catheterization, the frequency of catheterization will be decreased over several days from four hours to six hours and so on until the catheterizations are no longer needed. If you reach this point, ICP is usually discontinued, however you may be asked to catheterize yourself periodically to check your residual urine.

One way that the volumes in your bladder can be checked before you catheterize is with a bladder scanner machine. A bladder scanner is a small, portable ultrasound machine that can tell the amount of urine in your bladder just by rubbing a small wand on your lower abdomen where your bladder is located. It can tell you the amount of urine in your bladder without having to catheterize or remove an external collecting device.

If you are a male, before you can increase the number of hours, you should be urinating between your catheterizations. If you have sensation or awareness or bladder fullness, you will be encouraged to use “triggering” techniques to begin a reflex urination. If you do not have any bladder sensation, but you can empty your bladder reflexively, you will have to wear an external condom collection sheath (also called a *condom* or

Texas catheter) that will drain the urine to a urine drainage bag.

External Collection System for Men



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If you are a female, the approach is somewhat different due to the lack of an adequate external collecting device for women. Based on the bladder scan, the goal is to keep the amount of urine in your bladder below 400 cc and to stay dry between catheterizations, which will help to prevent skin breakdown.

Reflexive Bladder Techniques

"Triggering"

If you have a reflex (or spastic) bladder, you may be able to use the reflex to assist in emptying your bladder. Stimulating the reflex to work is called "triggering." Using triggers causes the bladder to contract, forcing the urine out through the sphincters. Examples of trigger techniques include: tapping over the bladder area, stroking the thighs, tugging on pubic hair or doing push-ups from the chair.

When trying to "trigger" the bladder to empty you should tap over the bladder area with your fingertips about eight times, stop and rest three to five seconds and tap again. This process should be repeated for a minute or until urination begins. Once the "trigger" area is stimulated, it will only take a few seconds to work.

Often however, the sphincters at the bottom of the bladder will be tight and even though you tap over the bladder and it contracts, the sphincters will not relax and let the urine out. This is called *bladder-sphincter dyssynergia*. And may require medications or other interventions to overcome it.

Bladder Stimulation

There are other new methods to assist with bladder management. Bladder stimulation systems (such as Vocare ®) include surgically implanted internal components and an external control unit. Internally, a pacemaker-type receiver-stimulator is surgically implanted under the skin of the chest or abdomen. The bladder system sends electrical signals through electrodes to the nerves that lead to the bladder.

You control this implant with an external controller which is about the size of a stereo cassette player. This unit consists of a microprocessor unit and a small transmitter antenna that is used when bladder stimulation is needed.

Autonomic Dysreflexia / Hyperreflexia

It is important to note that if you have a high spinal cord injury (T6 and above), you may exhibit signs of *autonomic dysreflexia / hyperreflexia* (pounding headache, nasal stuffiness, sweating) if the bladder becomes too full. **Autonomic dysreflexia is a medical emergency and the cause of the stimulation must be eliminated.** One of the most common causes of autonomic dysreflexia after a spinal cord injury is related to bladder or bowel problems. For this reason, you must pay close attention to your bladder management.

Indwelling Foley Catheter

A Foley catheter is a tube that is inserted into the bladder that has a round balloon near the tip that can be filled with sterile water in order to anchor it inside the bladder. The catheter is then left in the bladder to drain urine continuously into a urine drainage bag.

While many people do progress to intermittent catheterization and reflex voiding, there are some who do not, and therefore may use a Foley catheter for bladder management. This may be done if no spontaneous urination occurs, residual urine volumes remain high or both. Some people may not be able to control the leaking of urine in between catheterizations, even with the addition of medications.

Medical complications that necessitate drinking large volumes of fluid, such as repeated urinary tract infections, bladder or kidney stones, pneumonia, skin breakdown or a high fever may be other reasons why a Foley catheter may need to be inserted. Occasionally, in patients with uncontrolled autonomic dysreflexia, a Foley may be necessary.

In the hospital, sterile technique will be used to insert and maintain the catheter and the drainage bag, which form a closed system. This is done to prevent hospital-acquired or nosocomial infections. You will be taught this technique in order to prevent infection when you go home.

Another reason why a Foley catheter may be used is based on your ability to catheterize yourself or the availability of caretakers to catheterize you. If this is an issue, your independence in the community may be impacted, and therefore, a Foley catheter may become the best option to maximize your independence.

Long-term use of a Foley catheter may also create some potential problems. Foley catheters increase the possibility of urinary tract infections and stones, and may increase chances for bladder cancer.

Male Intermittent Catheterization Procedure

Purpose

To empty the bladder of urine at predetermined times.

Equipment You Will Need

- Prepackaged, sterile or straight catheter tray. Tray should include: a straight rubber or plastic catheter, cotton balls or swabs, antiseptic for cleansing and sterile gloves.

  Note: If you are using a self-contained catheter kit, the antiseptic, cotton and gloves may not be necessary.

- Something to wash your hands (washcloth, baby wipes, etc.)

  Note: Sterile procedure must be used in the hospital.

- External collecting device (if one is used).

Directions

1. "Trigger" your bladder to encourage urination. Measure the amount voided.

   Note: For people with non-reflex bladders, the crede procedure is used.

2. Wash your hands.
3. Open the catheter tray.
4. Open the sterile drape. Hold it by the edges, and place it between your legs.

   Note: Not necessary with the self-contained catheter kit.

5. Put on the sterile gloves. Do not touch the gloves to anything that is not sterile.

   Note: With many self-contained catheter kits, there is only one glove. Make sure this glove is on the hand that will remain sterile.

6. Pick up the second drape (the one with the hole in it), and place it over your penis. This should cover your lower belly and the area between your legs.

   Note: All kits should contain this drape.

7. Lubricate the catheter, and place it in the sterile tray.

   Note: For catheters not in self-contained kits, lubricate about 4" to 5" from the tip down. For Bard-Diamed ® kit, pour lubricant into catheter bag opening.

8. Prepare the cotton balls with Betadine solution, which helps prevent infection. Pour the entire contents of the package over the cotton balls.

   Note: Bard-Diamed ® kits have prepared swabs. Open the package.

9. Hold your penis with one hand, making sure your foreskin is pulled back.

   Note: If you are righthanded, hold your penis with your left hand. If left-handed, hold your penis with your right hand.

10. Using the cotton balls held by forceps or prepared swabs, cleanse the head of your penis. Stroke downward, using each cotton ball for one stroke only. Repeat this at least three times.

Note: Do not go “up” with the cotton ball after the downward stroke. Discard it onto the outer wrappings removed from the package.

Note: Once your hand has held your penis, it must be considered the “dirty” hand. Do not touch the sterile contents from the tray with it or the tip of your penis that you have just cleaned.11. Bring the penis up to about a 60 degree angle to your legs.

11. Bring your penis up to about a 60 degree angle to your legs.
12. With your gloved hand, pick up the sterile, lubricated catheter. Insert it gently into your penis. Push the catheter in until 4" to 5" remain. Urine should begin to flow. Now push the catheter in 1" more.

    Note: Sometimes you may spasm with catheterization. Wait for a minute and then continue. If you continue to meet resistance, do not force the catheter. Notify your nurse, doctor or the Spinal Cord Injury Follow-Up Clinic if this occurs.

13. Allow urine to drain from your bladder.
14. Remove the catheter by gently pulling it backward. Measure the volume of urine.
15. Reapplythe external collecting device, if applicable.
16. Wash your hands.

    Note: There may be special considerations for home catheterizations. Please make sure you understand how to carry out the entire procedure at home. Your nurse will help you plan for this.

Female Intermittent Catheterization Procedure

Purpose

To empty the bladder of urine at predetermined times.

Equipment You Will Need

- Pre-packaged, sterile or straight catheter tray. Tray should include: a straight rubber or plastic catheter, cotton balls or swabs, antiseptic for cleansing and sterile gloves.

Note: If you are using a self-contained catheter kit, the antiseptic, cotton and gloves may not be necessary.

- Something to wash your hands. (washcloth, baby wipes, etc.)

Note: Sterile procedure must be used in the hospital.

Directions

1. "Trigger" your bladder to encourage urination.

Note: For people with non-reflex bladders, the crede procedure is used.

2. Wash your hands.
3. Position yourself with your legs apart.

Note: Spasms may cause you to lose position. Sitting up at a 45 degree to 60 degree angle with knees bent and feet together will help you stay in position. A spreader bar may help.

4. Position a mirror so that you can see your urinary meatus.

Note: Several types of mirrors can be used: a large, round cosmetic mirror, a mirror strapped to your thigh or a mirror attached to the spreader bar between your legs. Eventually, you may not need to use a mirror.

5. Open the catheter tray.
6. Open the sterile drape. Hold it by the edges, and place it between your legs and under your buttocks.

Note: Not necessary with the self-contained kit. (e.g. Bard-Diamed ® kit).

7. Put on the sterile gloves. Do not touch the gloves to anything that is not sterile.

Note: With the Bard-Diamed ® kit, there is only one glove. Make sure this is put on the hand that will remain sterile.

8. Pick up the second drape (the one with the hole in it), and place over your genital area. This should cover your lower belly and the area between your legs.

Note: All kits should have this drape.

9. Lubricate the catheter, and place in the sterile tray.

Note: For catheters not in self-contained kits, lubricate about 2" to 3" from the tip down. For self-contained kits, pour lubricant into the catheter bag opening.

10. Prepare the cotton balls with Betadine solution, which helps prevent infection. Pour the entire contents of the package over the cotton balls.

    Note: Bard-Diamed ® kits have prepared swabs. Open the package.

11. Using the non-sterile hand, hold your labia apart.

    Note: If you are right-handed, hold your labia apart with your left hand. If left-handed, use your right hand.

12. Using cotton balls held by forceps or prepared swabs, cleanse the genitalia. Stroke downward, using each cotton ball for one stroke only. Repeat this at least three times.

    Note: Do not go “up” with the cotton ball after the downward stroke. Discard it onto the outer wrappings removed from the package.

    Note: Once your hand has held your labia, it must be considered the “dirty” hand. Do not touch the sterile contents from the tray with it or the area you have just cleaned with the “dirty” hand.

13. With your gloved hand, pick up the sterile, lubricated catheter. Insert it gently into your urinary meatus. Push: the catheter in about 2" to 3". Urine should begin to flow. Now push the catheter in 1" more.

    Note: Sometimes you will spasm with catheterization. Wait for a minute and then continue. If you continue to meet resistance, do not force the catheter. Notify your nurse, doctor or the Spinal Cord Injury Follow-Up Clinic if this occurs.

14. Allow urine to drain from your bladder.

15. Remove the catheter by gently pulling backward. Measure the volume of urine.

16. Wash your hands.

    Note: For home catheterizations, there may be additional considerations. Please make sure

that you understand how to carry out the entire procedure at home. Your nurse will help you plan for this.

Clean Technique for Intermittent Catheterization Program

Anyone who is being sent home on an Intermittent Catheterization Program has been taught a sterile technique of catheterization using disposable equipment. Any catheterization done in the hospital should be done using a sterile technique.

Certain people, however, may be taught at discharge to catheterize themselves using what is called the *clean technique*. Research has shown the clean technique to be a safe, easy and an economical way to catheterize yourself at home, if frequent (three to six times per day) catheterization is needed.

If you have any questions or concerns regarding clean technique for intermittent catheterization, please feel free to ask your nurse, doctor or the Spinal Cord Injury Follow-Up Clinic.

Clean Technique for Intermittent Catheterization

Purpose

A safe, economical means of emptying the bladder at regular intervals to keep it from becoming over-stretched.

Equipment You Will Need

- Clean red rubber or plastic catheter.

  Note: In an emergency, it is much more important to catheterize versus not catheterizing whether the catheter is clean or not.

- Soap and water, washcloth and towel (can be disposable).
- Water-soluble lubricant.

  Note: In order to economize, a large tube of lubricant may be purchased. It should, however, only be used for catheterizations.

- Container to drain the urine (if not using the toilet).
- Mirror (optional for females).
- Clean plastic bag.

Directions

1. Remove external collecting device (for males).

2. Wash your hands.
3. Position yourself.

   Note: Spasms may cause you to lose position. For women, sitting at a 45 to 60 degree angle with knees bent and feet together may help to maintain position. For men, sitting at a 45 to 60 degree angle helps them to see better.

4. Wash your genital area.
5. Identify your urinary meatus.

   Note: Females may need to use a mirror at first.

6. Lubricate the catheter.

   Note: For men, 4" to 5" from the tip of the catheter; for women, 2" to 3" from the tip of the catheter.

7. Grasp the catheter at a point about 4" from the tip and insert the catheter into your urinary meatus until the urine starts to flow. Once urine is flowing, insert another inch.
8. Allow the urine to drain. As the urine flow slows, gently press the bladder in a downward only movement to be sure the bladder is completely emptied.
9. Remove the catheter slowly.

   Note: Pinch the tubing together to prevent urine from dribbling when the catheter is completely removed.

10. After the catheter has been used, wash it immediately with soap and water. Dry.
11. Store catheter in a clean, dry plastic bag.

Male External Collecting Devices

Sheaths

Once you begin to void (urinate) between catheterizations, you may need to wear a device that collects the urine as you void so you will not get wet.

No one brand or method of external collecting system works for every person. Don't get discouraged if you need to try several different kinds to find the one that works for you.

When you first begin to void, you will need an external collecting device that is easy to put on and take off. When you are catherterizing three to six times each day, the "external" is

removed each time. If the external is difficult to remove, this could cause skin irritation to the penis.

Once you are voiding throughout the day, you may need an "external" with stronger adhesives, since it will need to stay on longer and last through many voids.

External Sheath: A latex or silicone condom-shaped sheath that goes over the penis. At one end: it has an opening that allows it to be connected to tubing that guides the urine to the leg bag. The sheaths are available in multiple sizes.

Securing Tapes and Fasteners

Most external sheaths need some kind of fastener to keep them on the penis. Some examples of fasteners include:

Securing Tapes: Made of foam rubber with glue on one side. These tapes can be placed both under and over the sheath.

Velcro and Gum Straps: May be placed circularly or spiraled around the penis.

"Gum" type Adhesives: Placed under the sheath by the manufacturer.

Guidelines for Applying External Sheaths

1. Wash your hands before and after applying the device.
2. Wash your penis with mild soap and water. Rinse well. If you are uncircumcised, pull back the foreskin. Wash, dry and then release the foreskin. (Never leave foreskin pulled back — it will act like a rubber band and limit the blood flow.)
3. When rolling the external on, do not roll it snug against the head of your penis — leave about 1" to 2" of space.

Fasteners: There are two methods used to apply the securing tapes:

1. **Spiral:** Applied like a stripe on a barber shop pole. Always use this technique for a strap applied under sheath.
2. **Circular:** Tape is placed around penis, but sticky ends are joined together, facing up. Never overlap! If you have an erection, the tapes must be able to expand. If you overlap the tabs, this could limit blood flow and lead to pressure sores on the penis.

3. Check your penis 20 minutes after applying the external to see if any swelling or irritation has occurred.
4. Remove the external at least once each day, washing your penis and checking for skin irritation.

Reasons for a Foley Catheter

Females

Although many women progress successfully through an Intermittent Catheterization Program, some find that they cannot control the flow of urine between catheterizations, even with the addition of medications. Some women may find that they cannot tolerate the medications used. A third reason some women may choose to use a Foley catheter is the level of their injury. Some quadriplegic women, who cannot transfer or catheterize themselves, may prefer a Foley catheter because it increases their independence in the community.

Males and Females

While most people do progress successfully through intermittent, there are some who are unsuccessful (e.g., no spontaneous voiding occurs, residual volumes remain high or both). A Foley catheter can be inserted to allow the person more freedom in his or her daily life.

Medical complications that require drinking large volumes of fluid also may be the reasons for insertion of a Foley catheter. Examples of these complications are: multiple urinary tract infections, pneumonia, pressure sores or a high fever. Insertion of a Foley catheter under these circumstances may be temporary, and the catheter may be removed after the problem has been resolved.

Insertion of the Foley Catheter

Procedure for Males

Note: Foley catheters are always inserted with strict sterile technique, both at home an in the hospital.

Purpose

To provide continuous drainage of urine from the bladder.

Equipment You Will Need

- Pre-packaged, sterile Foley catheter tray. Tray should include: Foley catheter, pre-filled syringe with sterile saline to inflate balloon, package or syringe with

lubricant, package of antiseptic for cleansing, cotton balls or swabs, sterile gloves and drapes.

Note: The size of the catheter and balloon are prescribed by your doctor. Never change the size of either one before asking your doctor or the Spinal Cord Injury Follow-Up Clinic.

- Empty 10 cc syringe.

Note: Some trays are called insertion trays. These trays do not have a Foley catheter in them. You will need a separately packaged catheter.

- 2" X 2" gauze pad or cap to cover the drainage tubing.
- Something to wash your hands. (washcloths, baby wipes, etc.)

Directions

1. Wash your hands.
2. Position yourself in bed.

Special Considerations:

Sitting at a 45 to 60 degree angle will help you to see better.

3. Remove the old Foley catheter.
    - Separate the Foley from the connecting tubing. (Not necessary with a closed system.)
    - Use an empty syringe to remove fluid from the balloon. Connect the syringe to the valve and gently pull it back.

    Note: If the fluid does not come out, contact your nurse, doctor or the Spinal Cord Injury Follow-Up Clinic for instructions.
4. Wash your penis with soap and water. Dry.

    Note: If uncircumsized, pull the foreskin back and wash and dry your penis.
5. Wash your hands again.
6. Open the catheter tray.
7. Place top drape, holding it by the corners, between your legs.

8. Put on the sterile gloves, being careful not to touch anything that is not sterile.
9. Pick up the second drape (the one with the hold in it), and place over your penis. This should cover your lower belly and the area between your legs.

   Note: All kits should contain two drapes.

10. Lubricate the catheter, and place in the sterile tray.

    Note: Lubricate the catheter 4" to 5" down from the tip.

11. Prepare cotton balls with Betadine solution, which helps prevent infection. Use the entire contents of the package over the cotton balls.

    Note: If the kit comes with prepared swabs, just open the package.

12. Hold your penis with one hand, making sure the foreskin is pulled back, if you are uncircumsized.

    Note: If you are right-handed, hold your penis with your left hand; if you are left-handed, hold it with the right.

13. Using cotton balls held by tweezers or prepared swabs, cleanse the head of your penis. Stroke downward, using each cotton ball for one stroke only. Repeat this at least three times.

    Note: Do not go “up” with the cotton ball after the downward stroke. Discard it onto the outer wrappings removed from the package.

    Note: Once a hand has held your penis, it must be considered the “dirty” hand. Do not touch sterile contents from the tray or the tip of your penis.

14. Bring your penis up to a 60 degree angle to your legs.
15. Pick up the sterile, lubricated catheter with your sterile hand. Insert it gently into your penis. Push the catheter in until about 4" to 5" remain. Urine should begin to flow. Now push catheter in 1" more.

    Note: Sometimes you will spasm with catheterization. Wait for a minute and then continue. If you continue to meet resistance, do not force the catheter. Notify your nurse,

doctor or Spinal Cord Injury Follow-up Clinic if this occurs.

16. Allow urine to drain from your bladder.

    Note: Do not inflate the balloon until you pass urine.

17. Inflate the balloon by putting the syringe filled with water into the Y-connection with the hard, plastic rim. Inflate the balloon with 7 to 9 ccs of fluid. Remove the syringe from the Y-connector.

    Note: Push fluid in gently. This will help to prevent the syringe from popping off the Y-connector. Try to use the same amount of fluid each time. This way, you will remember how much fluid to withdraw the next time you change the catheter.

18. Pull catheter out gently until you feel it catch.

19. Connect the end of the Foley catheter to the connecting tubing.

    Note: In the hospital, the Foley is already connected to the drainage tubing and bag, forming a closed system.

20. If uncircumsized, push your foreskin forward over the head of your penis.

21. Tape the catheter to your abdomen.

    Note: This prevents the catheter from being pulled out or a pressure sore from developing at the penile-scrotal junction.

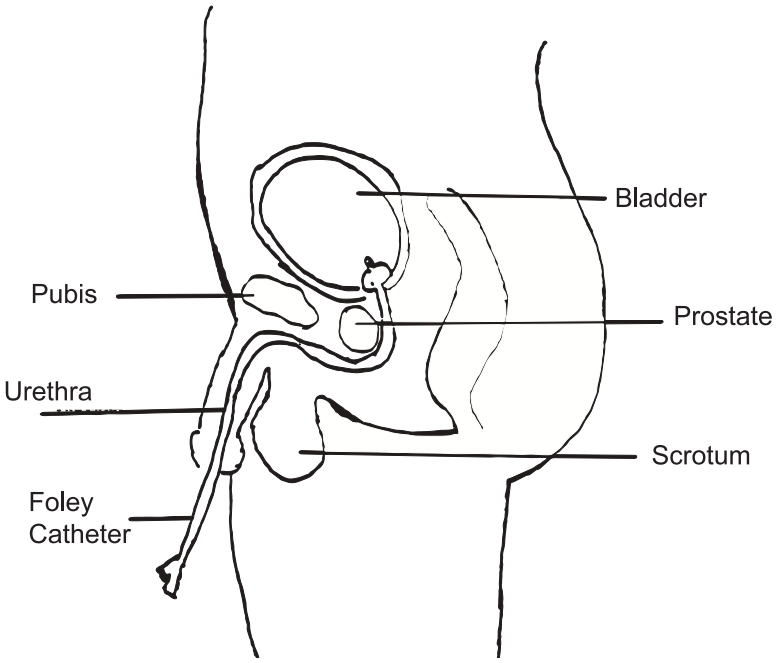
22. Wash your hands.

23. In about one hour, check the drainage bag to make sure that the bladder is draining.

    Note: If there is no urine in the bag, re-position the catheter and drink some fluids. Thirty minutes later, if there is still no urine, notify your nurse,

doctor or the Spinal Cord Injury Follow-Up Clinic.

Foley Catheter Placement for Males



Insertion of Foley Catheter

Procedure For Females

Note: Foley catheters are always inserted with strict sterile technique in the hospital and at home.

Purpose

To provide continuous drainage of urine from the bladder.

Equipment You Will Need

- Pre-packaged, sterile Foley catheter tray. Tray should include: Foley catheter, pre-filled syringe with fluid to inflate balloon, package or syringe with lubricant, package of antiseptic for cleansing, cotton balls or swabs, sterile gloves and drapes.

  Note: The size of the catheter and balloon are prescribed by your doctor. Never change the size of either one before asking your doctor or the Spinal Cord Injury Follow-up Clinic.

- Empty 10 cc syringe.

Note: Some trays are called insertion trays. These trays do not have a Foley catheter in them. You will need a separately packaged catheter.

- 2" X 2" gauze pad or cap to cover drainage tubing.
- Something to wash your hands. (washcloths, baby wipes, etc.)
- Mirror.

Directions

1. Wash your hands.
2. Position yourself in bed with your legs apart.

   Note: Spasms may cause you to lose position. Sitting up at a 45 to 60 degree angle with your knees bent and feet together will help you to keep position. A spreader bar may help.

3. Position a mirror so that you can see your urinary meatus.

   Note: Several types of mirrors may be used: a large, round cosmetic mirror, a mirror strapped to your thigh or a mirror attached to a spreader bar between your legs. As time goes on, you may not need to use a mirror.

4. Remove the old Foley catheter.
   - Separate Foley from the connecting tubing. (Not necessary with a closed system.)
   - Use the empty syringe to remove fluid from the balloon. Connect the syringe to the valve and gently pull back.

   Note: If the fluid does not come out, contact your nurse, doctor or the Spinal Cord Injury Follow-Up Clinic for instructions.

5. Wash your perineal area with soap and water. Dry.
6. Wash your hands again.
7. Open the catheter tray.
8. Place the top drape between your legs while holding the corners.
9. Put on the sterile gloves, being careful not to touch anything that is not sterile.

10. Pick up the second drape (the one with the hole in it) and place it over your genital area. This should cover your lower belly and the area between your legs.

    Note: All kits should contain two drapes.

11. Lubricate the catheter and place it in the sterile tray.

    Note: Lubricate the catheter down to 2" to 3" from the tip.

12. Prepare cotton balls with Betadine solution, which helps prevent infections. Pour the entire contents of the package over cotton balls.

13. Using the non-sterile hand, hold your labia apart.

    Note: If you are right-handed, hold your labia apart with your left hand, if you are left-handed, use your right hand. If finger function is limited, try using a labia-spreader.

14. Using cotton balls held by tweezers (or prepared swabs), cleanse your urinary meatus. Stroking downward, use each cotton ball for one stroke only. You should repeat this at least three times.

    Note: Do not go “up” with cotton ball after a downward stroke. Discard it onto the outer wrappings removed from the package.

    Note: Once a hand has held your labia, it is considered the “dirty” hand. Do not use this hand to touch sterile contents of the tray or the area you have just cleaned.

15. Pick up the sterile, lubricated catheter with your sterile hand. Insert it gently into the urinary meatus. Push the catheter in about 2" to 3". Urine should begin to flow. Now push catheter in 1" more.

    Note: Sometimes you will spasm with catheterization. Wait for a minute and then continue. If you continue to meet resistance, do not force the catheter. Notify your nurse, doctor or Spinal Cord Injury Follow-up Clinic if this occurs.

16. Allow urine to drain from your bladder.

    Note: Do not inflate the balloon until you pass urine.

17. Inflate the balloon by putting the syringe filled with water into the Y-connection with the hard, plastic rim.

Inflate the balloon with 7 to 9 ccs of fluid. Remove syringe from Y-connector.

Note: Push fluid in gently. This will help to prevent the syringe from popping off the Y-connector. Try to use the same amount of fluid each time. In this way, you will remember how much fluid to withdraw the next time you change the catheter.

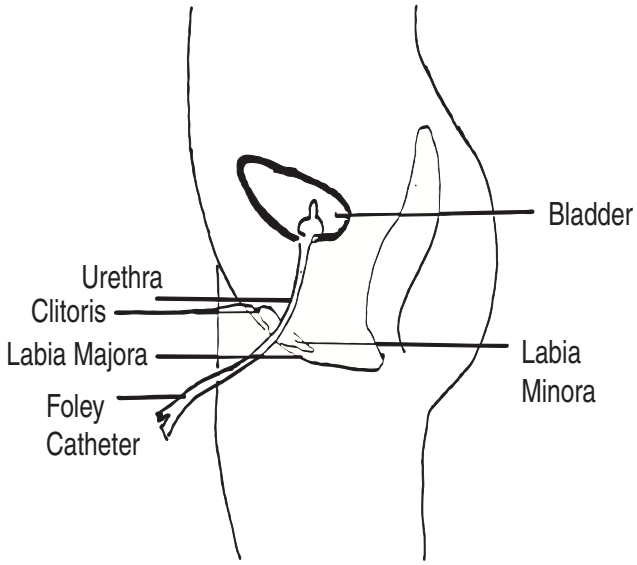
18. Pull the catheter out gently until you feel it catch.
19. Connect the end of the Foley catheter to the connecting tubing.

    Note: In the hospital, the Foley is already connected to the drainage tubing and bag, forming a closed system.

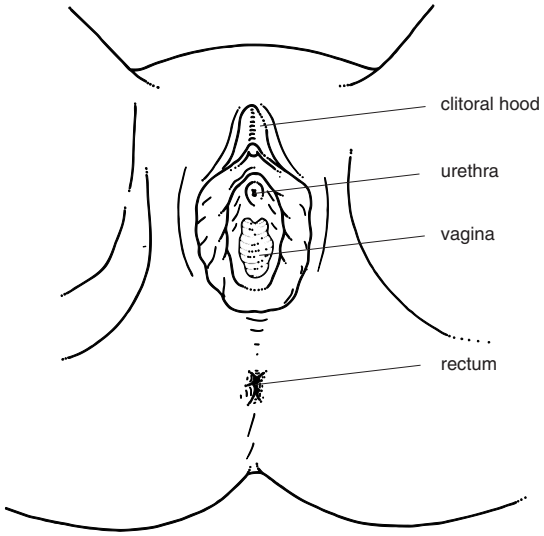
20. Tape the catheter to your thigh.
21. Wash your hands.
22. In about one hour, check the drainage bag to make sure that your bladder is draining.

    Note: If there is no urine in the bag, re-position the catheter and drink some fluids. If there is still no urine thirty minutes later, notify your nurse, doctor or the Spinal Cord Injury Follow-Up Clinic.

Foley Catheter Placement for Females



Anatomy of Female Genitalia



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Latex Allergy

What It Is

As an individual with SCI, it is highly likely that you will encounter catheter products that contain natural rubber latex. Ordinarily, contact with latex products isn't a concern to the average person. However, now that you will be dependent on

these products for maintaining proper bladder function, it is important to note that in recent years prolonged exposure to latex has created a public health issue known as latex allergy. In fact, latex allergy has become a significant concern among healthcare workers, including individuals who require frequent medical attention or hospitalization.

Several everyday objects contain latex, including balloons, carpet backing, elastic and erasers. And beyond certain catheter products, latex can be found in other health-related products such as in incontinence pads, surgical gloves, medical tubing and wheelchair cushions.

The concern arises from the fact that latex contains proteins that the immune system can recognize as allergens. And with recurrent exposure, the possibility exists that sensitivity will develop in some people. Exposure to these allergens occurs through ingestion (swallowing), inhalation, mucous membrane and skin contact with latex products.

Thus, reactions can be classified as one of four designated types with symptoms such as nausea and mild skin rashes to asthma and anaphylaxis, which is characterized by potentially fatal respiratory distress. Equally alarming is the fact that certain proteins in foods such as avocados, bananas, chestnuts, kiwis and tomatoes contain proteins that “cross-react” with latex. Once the proteins of these food items combine with those present in latex, the body's negative response can be magnified.

What to Do

In light of this reality, you must be your own strongest advocate. Take a personal inventory regarding your contact with latex, especially among your healthcare products. For example, if you are prone to pressure sores, the surgical tape that holds the dressing to your skin may contain latex. If you use certain enema products, the insertions tips as well as the bag itself likely contains latex. And, if you are a male who uses latex condom (Texas) catheters, your exposure is virtually twenty-four hours a day, seven days a week.

Keep in mind that alternatives to latex products exist. Recommendations include plastic, silicone and vinyl. Plastic-tipped products, silicone condom (Texas) catheters and vinyl surgical gloves and tape are but a few suggestions to limit your exposure to latex. Ask your doctor, pharmacist or healthcare product supplier for further suggestions. Also, remember to actively seek healthcare products that are labeled “latex-free” when you have such a choice.

Surgical Procedures

Surgical techniques may be considered to either improve the bladder as a storage organ or to overcome the sphincter resistance.

Suprapubic Catheter

Sometimes bladder drainage is accomplished by making a small surgical opening through your lower abdomen, directly into the bladder. Then, a large-sized Foley catheter is inserted and the balloon is inflated allowing the urine to pass through the tube to a urinary drainage bag. This procedure is not permanent and can be surgically reversed.

There are several reasons why this method may be used, including:

- Patient choice
- Severe swelling of the penis
- Urethral diverticula
- Penile-scrotal fistulas
- Frequent plugging of a urethral catheter
- More sexual freedom

Sphincter Releases (Males Only)

Sphincterotomy or Transurethral Resection

A sphincterotomy can be done surgically or with laser to the voluntary or external sphincter. In the surgical procedure, the sphincter is cut to reduce the tightness. A transurethral resection is a surgical cutting that is done to the internal sphincter or bladder neck. These procedures are done to decrease bladder-sphincter dyssynergia.

Balloon Dilatation

In this procedure, the urologist will insert a small catheter with a balloon into your urethra. The balloon is then inflated to stretch your sphincter. After the sphincter is stretched, the balloon is deflated and the catheter is removed.

Stent Placement

In this procedure, the doctor will use a cystoscope (a small tube) to place a small device that is used to keep your sphincter open.

Urinary Diversions

Ileal Conduit

An ileal conduit may be done if there are problems with all of the other ways of emptying the bladder. In this method, the urine is drained directly into a pouch made from the bowel. You will then have to wear a bag (like a colostomy) to collect the urine.

Bladder Augmentation

This procedure enlarges your bladder so it can hold a larger amount of urine.

Keep in mind that every bladder management program is different and is usually based on your individual needs, level of injury, caregiver availability and desired lifestyle.

Factors That Help with Successful Bladder Management

The Correct Amount of Fluid Intake

Adequate fluid intake is necessary in order to dilute the urine and help prevent urinary stasis (urine that sits in the bladder for more than four hours) that may lead to urinary tract infections and stone formation. Even if you are on a Intermittent Catheterization Program, 1800 to 2000 cc of fluid every 24 hours is necessary to maintain healthy kidney functioning. If your fluids are not restricted, you will be encouraged to drink at least 3000 cc of fluid each day. This is especially important with indwelling catheters. Water is, of course the best fluid to maintain proper hydration. Many other fluids (such as coffee, tea, caffeinated sodas and alcohol) may draw fluid out of your body (diuresis) and cause bladder over-stimulation.

An Adequate Diet

Maintaining urine that is slightly acidic will help to protect against urinary tract infections and stone formation. Foods that will help you do this include: meats, cheeses, prunes, cranberries, plums and whole grains. Chocolate, which has caffeine, also may over-stimulate your bladder.

Physical Activity

Physical activity has many benefits for you after a spinal cord injury. Inactivity or bedrest causes bone loss which leads to stone formation. For these reasons, it is important that you get out of bed because sitting in your wheelchair, eating, dressing,

transfers and mobilization activities help keep your body in shape and assists your bladder in emptying with the help of gravity.

Medications

Medications are often a very important part of your bladder management program. There are many types of medication used with different types of neurogenic bladders. More than one medication may be used or your medications may change over time. Please refer to the list of **Commonly Used Medications** at the end of this chapter.

A Lifetime Commitment to Health

It is important for you to know as much about your body and your injury as possible for you to take care of yourself properly. This will minimize the potential complication that can occur with regard to your bladder and every other system in your body. Your physician and the entire rehabilitation team in the Spinal Cord Injury Follow-Up Clinic is available to assist you along the way.

The Confidence Program

The Confidence Program at Magee Rehabilitation Hospital offers assistance in choosing continence products such as external catheters, collection devices, catheters and toileting devices. Teaching can be provided on different techniques that may make you more independent in managing your bladder.

Some individuals with spinal cord injury have some degree of voluntary control of the voiding process. They may benefit from an exercise program to help strengthen, facilitate and control the muscles used in voiding and maintaining continence. These exercises known as pelvic floor exercises (or Kegel exercises) can be taught utilizing biofeedback therapy.

You may be asked to keep a record of your food and fluid intake and urinary output. Review by you and the nurse will assist in developing a bladder management program. Medications may also be used to improve your continence.

Potential Bladder Complications

Problem	What is it?	Symptoms	What to do
Bladder Over-Distention	When your bladder becomes over-full and over-stretched. Urine will sit in the bladder longer, leading to an increase in urinary tract infections, bladder stones, autonomic dysreflexia and reflux.	Distended abdomen in the bladder area.	• Keep track of your fluid intake. • Avoid foods and fluids that stimulate the bladder. • Avoid fluids and foods that cause diuresis. • Maintain your bladder-emptying program. • Promptly manage signs and symptoms of autonomic dysreflexia.
Bladder or Kidney Stones	A stone is formed that is made from excess sediment and calcium in the urine. Stones can be formed in the kidney, ureter or bladder, blocking the flow of urine. Stones may be caused by an over-distended bladder, repeated UTIs or urine that is too concentrated from not drinking the right amount of fluids.	Pain. Blood in the urine. A sudden increase in spasms. Sweating. Autonomic dysreflexia Particles on the tip of an internal catheter or in the urine.	• Drink a lot of fluids. • Call your doctor or the Spinal Cord Injury Follow-Up Clinic if you have any of the signs or symptoms of stones.

Dysreflexia (Autonomic Dysreflexia or Hyper-Reflexia)

Autonomic dysreflexia is an exaggerated and potentially dangerous response of the autonomic nervous system to a stimulus below the level of your injury. The most common cause is bladder over-distention. However, dysreflexia can be caused by any stimulus below the level of your injury. Other common causes include: over-distended rectum, ingrown toenail, pressure on a pressure ulcer, sexual activity, menstrual cramps and labor. If left untreated, dysreflexia may result in a stroke or death. It should be considered a **medical emergency!**

Sudden onset of a pounding headache.

Elevated blood pressure (e.g. 320/180).

Goosebumps above the level of injury.

Sweating above the level of injury.

Flushing above the level of injury.

- Sit up straight in bed or your chair.
- Dangle your legs if possible.
- Have someone check your blood pressure. Continue to monitor every two to three minutes.
- Check for the cause. The number one reason is over-distended bladder, so remove your catheter or do an intermittent catheterization immediately.
- If your bladder is not the cause, check for other potential causes.
- If the dysreflexia is not relieved in 5 to 10 minutes, call 9-1-1 for medical assistance.
- If this is a frequent problem, you may be put on medication to manage the symptoms.

Dysreflexia (Continued)	When your bladder contracts, the urethral sphincters become tighter, instead of relaxing to allow the urine to flow from your body. Dyssynergia leads to increased bladder pressure, and can lead to reflux and potential kidney damage and failure.	Lack of coordination in emptying your bladder. You may have small amounts empty with triggering methods and be leaving larger amounts in your bladder. Unfortunately, there may not be any signs other than an unbalanced intake and output.	• Maintain your bladder program. • Monitor your intake and output and make sure that they are balanced. • Have the appropriate bladder testing done on an annual basis or as prescribed by your doctor. • Medications or surgery may be necessary in order to decrease the amount of dyssynergia you are experiencing.
Penile-Scrotal Fistulae	A hole at the base of the penis, next to the scrotum. The hole extends from the urethra through the skin. It can be caused by pressure from an indwelling catheter. Catheters that are allowed to hang and are not taped to the abdomen also can cause the pressure to occur at the penile-scrotal junction.	Swelling. Redness at the penile-scrotal junction. Urine leaks from a hole at the base of the penis.	• Tape the catheter to your abdomen. • Call your doctor or the Spinal Cord Injury Follow-Up Clinic immediately. • If it is severe enough, it may require surgery to repair it.

Reflux	Urine from the bladder is forced back up into the ureters and kidneys due to malfunctioning of the valves in the ureters. Increased pressure in the bladder also adds to reflux.	There are NO clinical symptoms.	• Yearly urinary tract work up prescribed by your doctor.
Urinary Tract Infection	Bacteria that grows in the urine.	Fever of greater than 101 degrees. Chills. Sweating. Blood or blood clots in the urine. Increase in bladder spasms. Nausea and vomiting. Decreased urine output. Pain in the back around the waist area (if you have feeling). Sudden increase in spasticity. Generally not feeling well.	• If you have any of the above symptoms, call your doctor or the Spinal Cord Injury Follow-Up Clinic. • Rest. • Drink plenty of fluids. • Your doctor may prescribe antibiotics for you. Take them until they are gone.

Blocked Catheter	Urine is unable to pass through the catheter due to a blockage in the catheter. This blockage may be from sediment, mucus, blood clots or stones.	General discomfort. Dysreflexia. Leg bag or drainage bag may be empty. Voiding around the catheter. Feeling of fullness in the lower abdomen. Your lower abdomen may appear distended.	• Check the tubing of the catheter and straighten it if is kinked. • Change position. • If the above has not corrected your symptoms, remove the catheter and insert a new one.
Problems When Removing a Catheter	The balloon will not deflate. This can be due to a defect in the balloon, Y-connector or the syringe. OR: The Y-Connector is cut.	Fluid does not flow out when the syringe is attached to the Y-connector.	• Do not pull on the catheter. • Call your doctor or the Spinal Cord Injury Follow-Up Clinic immediately. • Balloon will need to be deflated by a trained professional.

Difficulty Inserting Catheter: Diverticulum	Finger-like projections form along the urethral wall. They can be as a result of multiple infections or can be natural.	The catheter passes easily into the urethra but no urine drains. OR When the catheter is inserted, it meets resistance but no urine returns.	• Do not inflate the balloon. Remove the catheter and insert a new one, keeping a slight amount of tension on the penis. Insert gently! If resistance is met, call your doctor or the Spinal Cord Injury Follow-Up Clinic immediately. • If the catheter can be passed and urine flows, inflate the balloon. • If there is blood in your urine, call your doctor or the Spinal Cord Injury Follow-Up Clnic immediately.

Difficulty Inserting Catheter: Tight Sphincter	Urethral sphincter becomes tighter than normal.	Catheter passes easily and then meets with sudden resistance.	• Wait several minutes and try to insert the catheter again. Try taking several slow, deep breaths exhaling through your mouth. • If the catheter still cannot pass, have someone help you do a rectal stretch. Try inserting the catheter while the rectum is stretched. • If you are still unable to insert the catheter, stop! Call your doctor or the Spinal Cord Injury Follow-Up Clinic immediately. • Bladder testing may need to be done to determine what is causing the problem. • Medications may be prescribed to relax the sphincter. • Surgery may be needed if this remains a problem over time.

Medications Commonly Used in Bladder Management

Type of Medication	Name	Use
Anticholinergics	Ditropan XL ®, Detrol ®, Levsinex ®	These drugs decrease bladder muscle hyperactivity (or spasms). This allows for an increase in bladder capacity. This helps to prevent "accidents."
Alpha Adrenergic Blockers	Flomax ®, Hytrin ®, Cardura ®	These drugs reduce internal sphincter spasticity, relax the bladder neck (urethra) and thereby reduce bladder-sphincter dyssynergia. This allows urine to pass more freely.
Alpha Adrenergic Stimulants	Ephedrine ®, Sudafed ®	These drugs work to increase bladder neck and sphincter tightness.
Antispasticity / Muscle Relaxants	Zanaflex ®, Valium ®, Dantrium ®, Lioresal ®	These drugs are muscle relaxants that may have some effect on relaxing the external sphincter, thereby assisting in the reduction of dyssynergia.
Urinary Antiseptics	Mandelamine ®, Hiprex ®	Lowers the pH of the urine to make it more acidic. Bacteria have a more difficult time growing in acidic urine.
Antibiotics	Bactrim ®, Macrodantin ®, Tetracycline ®, Keflex ®, Quinolones ®, Penicillins ®, Aminoglycosides ®	These drugs are used to destroy or stop the growth of bacteria-causing infection.

If You Have An Indwelling Catheter (Foley)

Problem	What to do	Why
Catheter Is Kinked	Straighten the catheter and urine will drain. If not, look for another cause.	A block in the catheter will prevent the urine from draining. If the catheter is blocked, the bladder could become over-stretched and cause autonomic dysreflexia.
Leg Bag or Bedside Drainage Bag Is Overfilled	Empty the bag. Check to see if the catheter is draining urine after the bag is empty.	When the leg bag fills completely, the urine will back up in the urinary system, and your bladder will not drain.
The Catheter Is Plugged (Is the Urine Draining?)	Remove the catheter. Insert a new catheter to allow the urine to drain. Do not try to clean a plugged catheter.	If a catheter is plugged, it will block the urinary system and prevent urine from draining. If the catheter is blocked, the bladder could become distended and cause autonomic dysreflexia.

Further Precautions And Recommendations:

If you clamp your Foley catheter to obtain a urine specimen, do not forget to unclamp it. (Do not clamp for more than 15 minutes.)

If your Foley catheter blocks often because of sediment and mucous:

1. Drink more fluids.
2. You may have to change your catheter more frequently (every two weeks instead of once every six weeks).
3. Your doctor may suggest cleaning your bladder with a weak acid solution (Do not clean a blocked catheter!)
4. Taping your catheter to your abdomen may prevent it from kinking.

Glossary

Bladder	A hollow, muscular organ where urine is stored.
Bladder Management Program	A program developed to allow the effective elimination of urine and maintain a healthy bladder.
Bladder Retraining	The techniques used to promote bladder control.
Bladder Scanner	A non-evasive ultrasound machine that can accurately measure the amount of urine in the bladder.
Catheterization	A procedure where a small tube is inserted into the bladder, through the urethra, to empty it. The tube may be immediately removed or remain in the bladder for a period of time.
Continence	The ability to hold urine and control elimination.
Diuresis	Elimination of unusually large amounts of urine.
Dysreflexia	A potentially life-threatening rise in blood pressure associated with a full bladder. Symptoms include: a pounding headache, profuse sweating and a flushed appearance.
Dyssynergia	Difficulty passing urine because the bladder and sphincter work against each other.
Fluid Restriction	Limiting fluid intake to no more than two liters per day.
Incontinence	The inability to hold urine.
Kidneys	Organs that filter fluid waste products from the blood and produce urine.
Neurogenic Bladder	Difficulty eliminating urine resulting from an illness or injury to the brain, spinal cord or nerve supply to the urinary bladder.
Over-Distention	A bladder that is disproportionately full and stretched.
Reflux	Urine backing up into the kidney.
Residual Urine	The amount of urine left in the bladder after it is emptied.
Sphincter	A muscle surrounding the bladder opening that allows expansion and contraction, causing it to open and close.
Spinal Shock	A period of time after injury during which all spinal reflexes are absent.
“Triggering”	Stimulating reflex urination by tapping over the bladder.

Ureters	Long tubes that go from the kidneys to the bladder.
Uretero	The place where the ureters enter the bladder. Also known as the vesicle junction.
Urethra	The tube that goes from the bottom of the bladder to the outside of the body, draining the urine out.
Urinary Tract Infection	An infection in the bladder or urethra.
Urination	The process of allowing urine to pass out of the body.

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Comments and Feedback

The staff of the center has recently spent a lot of time and effort in revising this manual. However, we realize that those who are actively reading and using the manual can improve it. As a part of our program of continuous quality improvement, we ask you to help guide our efforts to improve the manual.

In the next section of the chapter are two forms. The first form is an overview by chapter that seeks to identify those areas of the manual that could benefit the most from additional work. We also seek to identify any major areas of concern that have not been addressed.

The second section is a more focused questionnaire that has as its goal the specific items that should be targeted. For example, should an item be added to the glossary or the definition changed. Should a drug be added to the discussion of bowel programs?

The more specific the comments are the more likely that we will be able to make the improvements that form the basis of your idea. By communicating with the Regional Spinal Cord Injury Center of the Delaware Valley, however, users grant us permissionto use any information, suggestions, ideas, drawings or concents communicated for any purpose we choose, commercial, public or otherwise, without compensation or acknowledgement whatsoever.

Thank you for taking the time to assist us in improving this manual.

Sincerely,

SCI Manual Committee

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Feedback Form

Rate each chapter by placing an "X" on the scale underneath the term that best captures your opinion. Using the next page, provide specific comments regarding your ratings. Feel free to make copies of the next page.

	No Opinion	Fair	Satisfactory	Good	Excellent
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Sexuality					
Spinal Cord Injury Follow-Up Care System					
Master Glossary					

Suggestions and Comments

Chapter: _____

Page(s): _____

Comments: _____

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Any terms that need to be added to the glossary? How would you define the terms?

Any section or paragraph that was not clear?

Any drawing or sketch that would help to illustrate the material being covered?

Any additional topic that should be covered?

Any questions you have that you feel should have been answered by the manual?

What is the question?

What is the suggested answer?

Any references that should be added? Any other resources that should be mentioned?

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