The following excerpt has been taken from the Christopher & Dana Reeve Foundation Paralysis Resource Center website. 
http://www.christopherreeve.org/site/c.mtKZKgMWKwG/b.4453411/k.BF84/Bladder_Management.htm

Bladder Management

Paralysis at any level almost always affects bladder and bowel function. This is because the nerves controlling these internal organs are attached to the very base of the spinal cord (levels S2–4) and are therefore cut off from brain input.

Although it may not be possible to regain the same control one had before paralysis, a wide range of techniques and tools are available to manage bladder and bowel function.

How the bladder works:

Urine consists of excess water and salts that are extracted from the bloodstream by the kidneys. From the kidneys the urine is pumped down thin tubes called ureters, which normally allow the urine to flow only in one direction. The ureters connect to the bladder, which is basically a storage bag. When the bladder is full, nerves send a message by way of the spinal cord to the brain.

When one is ready to go, the brain sends a message back down the spinal cord to the bladder, telling the detrusor muscle (the bladder wall) to contract, and the sphincter muscle, a valve around the top of the urethra, to relax and open. Urine then passes down the urethra to exit the body. It’s a rather elegant process of muscle coordination just to go pee.

After paralysis, though, the body’s normal system of bladder control goes haywire; messages can no longer pass between the bladder muscles and the brain.

It is quite common for people with MS to have some problems with bladder control. This can involve a little leaking after a sneeze or laugh, or it can involve loss of all control. Appropriate clothing, padding and devices for incontinence are useful to cope with lack of control.

After spinal trauma, the bladder is usually affected in one of two ways:
Spastic (reflex) bladder is when your bladder fills with urine and a reflex automatically triggers the bladder to empty. Spastic bladder usually occurs when the injury is above the T12 level. With a spastic bladder you do not know when, or if, the bladder will empty.

Flaccid (non-reflex) bladder is when the reflexes of the bladder muscles are sluggish or absent. If you do not feel when the bladder is full, it can become over-distended, or stretched. The urine can back up through the ureters into the kidneys (called reflux). Stretching also affects the muscle tone of the bladder.

Dyssynergia occurs when the sphincter muscles do not relax when the bladder contracts. The urine cannot flow through the urethra, which can result in the urine backing up into the kidneys. The bladder may also not empty completely. Treatments include medications or surgery to open the sphincter.

The most common methods of bladder emptying are with intermittent catheterization (ICP); indwelling catheter (foley); and an external condom catheter for men.

There are several surgical alternatives for bladder dysfunction. A Mitrofanoff procedure constructs a new passageway for urine using the appendix. This allows catheterization to be done through the abdomen to the bladder, a great advantage for women and for people with limited hand function.

Bladder augmentation is a procedure that surgically enlarges the bladder (using a portion of the intestines) to reduce the need for frequent catheterization.

Sphincterotomy reduces pressure on the valve and thus allows urine to flow out of the bladder easier. There is a chance that the operation will affect a man’s ability to obtain a reflex erection. This operation is not normally carried out on women.

**Urinary Tract Infection**

People who are paralyzed are at a high risk for urinary tract infection (UTI). The source of infection is bacteria -- a group or colony of tiny, microscopic single-celled life forms that live in the body and are capable of causing disease.

Bacteria from the skin and urethra are easily brought into the bladder with ICP, foley, and suprapubic methods of bladder management. Also, many people are not able to completely empty their bladder; bacteria are likely to grow in urine that stays in the bladder.

Some of the symptoms of UTI are fever, chills, nausea, headache, increased spasms, and autonomic dysreflexia (AD). You may also feel burning while urinating, and/or discomfort in the lower pelvic area, abdomen, or lower back.

The key to preventing UTI is to halt the spread of bacteria into the bladder. Proper cleaning of urinary care supplies can help prevent infection. Sediment in the urine can collect in tubing and
connectors. This can make it harder for your urine to drain and can make it easier for bacteria to spread. Clean skin is also an important step in preventing infection.

Drinking the proper amount of fluids helps to “wash out” bacteria and other waste materials from the bladder. This can help prevent UTI and lessens the chance of other problems of the urinary system.

A complete medical check-up is recommended at least once a year. This should include a urologic exam, including a renal scan or ultrasound to know the kidneys are working properly. The exam may also include a KUB, an X-ray of the abdomen that can detect kidney or bladder stones.

Even with a regular bladder management program and proper prevention methods, the risk remains for urinary tract infection. Treatment for a UTI almost always includes an antibiotic medication prescribed by a doctor.

Bladder cancer is another concern for some individuals with spinal cord injury. Research shows an increase in the risk of bladder cancer among those who have been using indwelling catheters for a long period of time. Smoking also increases the risk for developing bladder cancer.

Sources: National MS Society, Spinal Cord Injury Information Network, University of Washington School of Medicine/Department of Rehabilitation Medicine

Web Sites

http://www.pva.org
Paralyzed Veterans of America: Bladder Management Following Spinal Cord Injury—What You Should Know (consumer version)
Can be downloaded for free from the PVA website

http://www.pva.org
Paralyzed Veterans of America: Bladder Management For Adults with Spinal Cord Injury—A Clinical Practice Guideline for Health Care Professionals
Can be downloaded for free from the PVA website

http://sci.rutgers.edu/
CareCure Community
CareCure Community features a forum with informed comments on matters of the bladder and bowel, and all issues related to paralysis health and wellness.

http://calder.med.miami.edu/pointis/urinary.html
University of Miami School of Medicine: Urinary Tract Management in Spinal Cord Injury


**Spinal Injury Information Network**
The Spinal Cord Injury Information Network lists various resources related to bladder function, including fact sheets, articles, and forums.

http://sci.washington.edu/about_us/index.asp

**Northwest Regional Spinal Cord Injury System, University of Washington School of Medicine, Rehabilitation Medicine**
The University of Washington School of Medicine/Department of Rehabilitation Medicine offers details on bladder management, including downloadable pamphlets, reports, and videos.

http://sci.washington.edu/info/pamphlets/bladder.asp
Bladder Management
http://sci.washington.edu/info/pamphlets/uti_1.asp
Urinary Tract Infections: Intermittent Catheterization
http://sci.washington.edu/info/pamphlets/uti_2.asp
Urinary Tract Infections: Indwelling (Foley) Catheter
Management of Urinary Problems Caused by Spinal Cord Injury (report and streaming video, 65 minutes)
http://sci.washington.edu/info/forums/reports/intrathecal_baclofen.asp
Intrathecal Baclofen Therapy for Spasticity (report and streaming video, 85 minutes)

http://www.suna.org/resources/adultCICGuide.pdf
**Society of Urologic Nurses and Associates: Clinical Practice Guidelines—Adult Clean Intermittent Catheterization**

**Medline Plus: Urinary Catheters**
Information on various kinds of urinary catheters.

**National Kidney and Urologic Diseases Information Clearinghouse: Your Urinary System and How it Works**
The National Kidney and Urologic Diseases Information Clearinghouse provides an overview of the urinary system (also available as a printable PDF) and links to other organizations that can provide additional information.
To find catheter and catheter supply companies and distributors, see:

http://www.abledata.com
Abledata’s database
Listings related to catheters can be accessed by clicking on Products, then clicking on Aids for Daily Living, then scrolling down to the Toileting section.


http://www.180Medical.com
180 Medical
Phone: 877-688-2729 (Toll Free)
180 Medical is a large distributor of many brands and types of catheters. The company also provides educational resources on catheters. A portion of all catheter sales goes to the Christopher & Dana Reeve Foundation.

https://craighospital.org/resources/topics/bladder-care
Craig Hospital: Bladder Care Resources

Bladder Cancer

http://www.cancer.gov/cancertopics/types/bladder
National Cancer Institute: Bladder Cancer

http://www.oncolink.upenn.edu/types/article.cfm?c=21&s=66&ss=768&id=9464
Oncolink (Abramson Cancer Center of the University of Pennsylvania): Bladder Cancer

Bladder Augmentation and Mitrofanoff procedure

http://www.urologyhealth.org/urology/index.cfm?article=56
American Urology Association Foundation: Bladder Augmentation

http://www.childrenshospital.org/az/Site2091/mainpageS2091P0.html
Children’s Hospital Boston: Bladder Augmentation
The following books and videos are available for free loan from the PRC library. For more information, please visit the online catalog at:

http://www1.youseemore.com/ReevePRC/default.asp

**Books**


Videos

- **Clean Intermittent Catheterization.** Lawrence, KS: Learner Managed Designs. (29 minutes)


- **Urinary Tract Infection in Individuals with Spinal Cord Injury.** Columbia, MO: University of Missouri-Columbia, 2001. (8 minutes)


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