



## | RYGG MÄRGS | SKADA

<http://www.ryggmargsskada.se>

The following text is a selection from the website.

**Author:** Carina Andersson,  
Nurse, Urotherapist



**Translation:** funded by Allmänna  
Arvsfonden & project RG Integration.

<http://www.rgintegration.se/en/>

## Spinalis®

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The Spinalis Foundation is a charitable foundation with the mission to promote research and develop treatments for people with SCI.

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## Bladder

The ability to empty the bladder is often disturbed by a spinal cord injury. The signals to the brain do not reach their destination. The feeling of the need to urinate disappears, and the ability to empty the bladder is affected. The impact on the bladder depends on the level and extent of the spinal cord injury.

When we need to urinate, signals from nerves in the wall of the bladder are sent to our brain via the spinal cord, which tells us that we need to go to the toilet. Normally, an adult urinates 5-7 times a day and excrete 2-4 dl of urine in the bladder during the day and a larger volume, about 4-7 dl, in the morning. Of course, the amount of urine and the number of times a person urinates depends on how much you drink. Normally, it is recommended to drink 1.5-2 litres of liquid per day.

### HOW THE BLADDER WORKS WITH A CASE OF SPINAL CORD INJURY

The ability to empty the bladder often becomes disturbed by a spinal cord injury. The signals to the brain do not reach their destination. The feeling of the need to urinate disappears, and the ability to empty the bladder is affected. You cannot stop the urine from flowing out or you cannot urinate and empty the bladder. The inability to empty the bladder or leaking urine affects a person's quality of life, kidneys and bladder. Depending on the scope and level of the damage, the function of the urinary bladder develops differently.

**In case of higher injuries**, i.e. spinal cord injuries above the thoracic vertebra 12 (T12), an overactive bladder may develop.

In the event of complete injury to the spinal cord, there is initially no feeling of needing to urinate. In the event of damage to the spinal cord above thoracic vertebra (T6), you may feel a sense of urgency in the form of autonomous signals as the blood pressure rises and you have symptoms such as redness in the face, slight headache or sweating. If you do not empty the bladder then it can lead to autonomous dysreflexia (AD).



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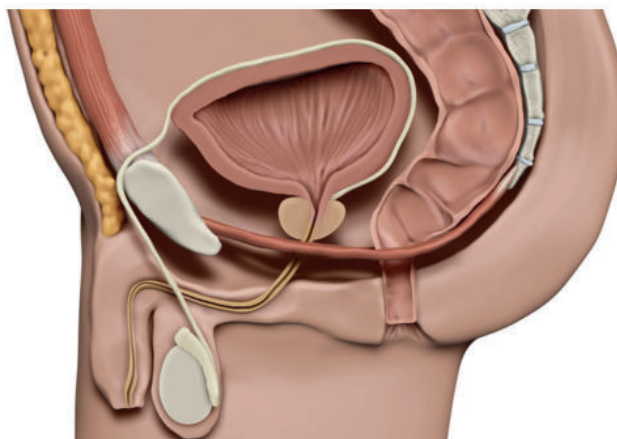
The bladder can contract uncontrollably, which can lead to leaking urine, a so-called reflexive bladder or spastic bladder. The bladder rarely empties completely, and residual urine remains. If there is residual urine in the bladder for too long, it becomes a good breeding ground for bacteria, which can lead to a urinary tract infection.

Bladder contraction with a closed urethra (spastic sphincter) can lead to high pressure in the bladder with the risk of urine backing up to the kidneys. This can lead to dilated ureter and, in the worst case, kidney damage. It also increases the risk of severe febrile infections, renal pelvic information and blood poisoning (sepsis).

**In case of lower injuries**, i.e. spinal cord damage below the thoracic vertebra 12 (T12), the bladder becomes underactive. In case of complete damage, there is no feeling of the need to urinate nor a feeling of a full bladder. The bladder has difficulty contracting to empty itself. Residual urine may remain in the bladder after discharge, which may lead to infection.

The pressure in the anal muscle, the sphincter, is low, which can lead to incontinence during physical exertion, such as coughing and sneezing or with movement.

Straining can be one way of emptying the bladder, but often with the result of residual urine. In addition, the pelvic floor is overstrained by applying this extra pressure.



The pelvic floor of a male at rest.

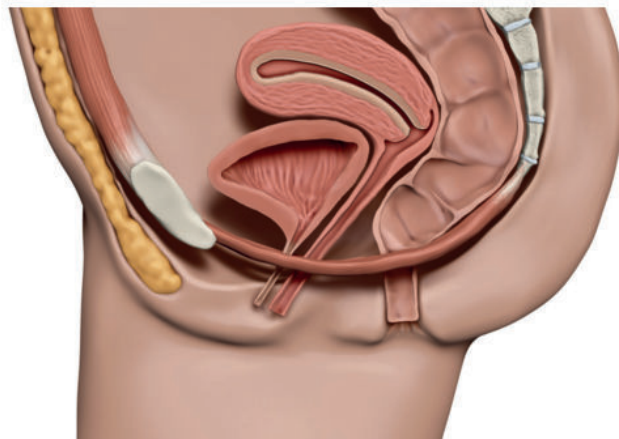


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The pelvic floor of a female at rest.



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### BLADDER REGIME

There are different ways of emptying the bladder. Below are some of the most common bladder regimes today:

**CIC** — Clean Intermittent Catheterisation is by far the most common and recommended way to empty the bladder. When you undergo CIC, a disposable catheter is inserted into the bladder via the urethra, which empties the urine into a bag or into an extension hose leading straight down into the toilet. As the urine starts to flow, you know that you are inside the bladder. CIC should be performed 4-6 times/day, with a bladder volume of 3.5-4 dl. CIC should be performed by experienced staff at your rehab unit, urology clinic or at a urotherapist. There are many different brochures on CIC and spinal cord injuries that can be useful to read through. If you have an incomplete injury, and you can urinate on your own a little bit, you can use a catheter and drain the residual urine afterwards.

**IUC** — Indwelling Urinary Catheter. Initially used from a few days to a few weeks. This catheter should be replaced by a healthcare professional every 8-12 weeks. You can connect an open/close valve to the catheter. A urine bag can be connected to the valve so that the urine from the bladder is discharged directly into the urine bag, which is then emptied. Or if you don't have a bag, the valve can be opened and the urine empties directly into the toilet.



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**SPC** — A suprapubic catheter is an indwelling urinary catheter that goes through the abdominal wall into the bladder. In case of upper cervical (cervical spine) injuries (C3-5) where hand function is impaired, a suprapubic catheter is preferred. The risk of prolonged use of a catheter through the urethra is that there may be pressure damage to the urethra. Another option in case of injuries to the upper part of the spinal cord is to give the person assisted CIC, using assistants.

### CHOICE OF CATHETER

All catheters used for CIC are disposable catheters. Most people choose a catheter with a hydrophilic surface, which means that when it becomes wet, it has a very slippery surface. This facilitates insertion into the urethra. Most people with spinal cord injuries have received information at the spinal injury clinic about which catheter is best suited to them. There are a host of different catheters, and different county councils have different agreements with manufacturers. The most commonly used catheter has a tip called Nelaton. It is gently rounded at the tip.

Women's catheters are shorter than men's catheters. The female urethra is 3-5 cm long, and the male urethra is approximately 18-23 cm. Catheters, bags and incontinence protection are free and prescribed by a urotherapist or district nurse and arrive at home in unmarked packages.

### TREATMENT

**An overactive bladder** can be treated with drugs that calm the bladder to minimise urine leakage. These medications also prevent excess pressure in the bladder and therefore reduce the risk of kidney damage.

Botox (botulinum toxin a) is another form of treatment for calming an overactive bladder. This is done at urology clinics. Urologists inject the drug via a cystoscope into the urethra into the wall of the urinary bladder. The result is that the bladder is "paralysed" and the unsettled signals to the bladder muscle disappear. The effect remains for about 6-9 months.

When using drugs that calm the bladder, you must still be able to empty the bladder regularly and this is usually done through CIC.



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A **weak bladder** (underactive bladder) is treated with CIC. It is important to empty the bladder, before more strenuous activities to reduce the risk of leakage.

### COMPLICATIONS

The ideal bladder regime should be as easy as possible to implement while minimising the risk of complications.

**Urinary tract infections (UTI)** are the most common complication after spinal cord injury. If you feel out of sorts, in poor general health, have urine leakage (when you do not usually have it), foul-smelling and cloudy urine, fever, increased spasticity and/or back pain, you should contact your healthcare centre to submit a urine culture. There is a difference between urinary tract infection and bacteria in the urine.

**Many people with CICs with SPC have bacteria in the urine** but they do not have symptoms of UTI. Bacteria in the urine should not be treated without symptoms. However, symptoms may look different in the case of neurogenic blisters, and attention should be paid to changes/worsening of the blister pattern such as increased urine leakage, increased sweating, diffuse pain over the bladder, difficulty in inserting catheters, blood in the urine, etc.

**Minor bleeding with CIC.** There may be a slight irritation of the urethra during CIC. There is no great danger if there is a little blood on the catheter. The mucous membrane will heal quickly. This is most common in conjunction with starting CIC.

**Residual urine.** The bladder is not emptied completely, but there is urine left in the bladder after emptying. If urine remains in the bladder for too long, it is a good breeding ground for bacteria which can lead to a urinary tract infection.

**Urine leakage between CIC sessions.** In order to reduce problems with leakage, you can try out medicine that calms the bladder, perform CIC more often, and even before strenuous activities.

Urine leakage can cause skin irritations and wounds. If you have problems with urine leakage, talk to your local nurse so that you get access to optimal incontinence protection.



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**Kidney stones and/or stones in the bladder** may develop with spinal cord injuries. These are more common in people with IUC, indwelling urinary catheter, or SPC, suprapubic catheter. If you have dense urinary tract infections, you should it checked out with an ultrasound or X-ray examination so that there are no stone(s) in the urinary tract. Stones in the bladder are usually removed via the urethra at the urology clinic.

### HOW CAN I AVOID COMPLICATIONS?

**Use disposable hydrophilic catheters for CIC.** Hydrophilic catheters have a special coating that becomes slippery when they come in contact with water. The special coating protects the mucous membrane of the urethra.

**Review your fluid intake,** 1.5-2 litres/day. Drink more if you exercise and/or sweat a lot.

**Perform CIC 4-6 times/day,** no more than 350-400 ml of urine in the bladder when undergoing CICs. In the morning, you may have a little more.

**Wash hands before CIC,** normal genital hygiene with mild soap once a day.

**Wipe the urethra opening** with soft tissue prior to each CIC session.

**Drink water with lime or lemon,** to acidify the urine. Sweet drinks are not recommended, however, as this creates a breeding ground for bacteria.

**It is important to empty your bladder when you urinate,** with a catheter or as usual.

**If you are urinating as usual** due to incomplete spinal injury, you can try the triple void technique. Sit/stand and urinate what you can, pause for a while, stand up, take a few steps, then try again. Repeat three times.