



Bladder Management

A guide for patients

Key points

- Urinary issues remain one of the highest causes of readmission to hospital following Spinal Cord Injury (SCI).
- Following SCI most patients experience some degree of bladder dysfunction. This is commonly called 'Neurogenic bladder dysfunction'.
- Bladders may present as being reflexic (upper motor neuron), flaccid (lower motor neuron) or mixed depending on the level of their injury.
- All patients with SCI should have urodynamics (bladder pressure test) and Renal Ultrasound performed.
- Complete regular emptying of the bladder prevents urinary tract infections.
- Maintaining an adequate fluid intake (2L per day minimum) is essential to your urological health.
- Straining to empty your bladder may be dangerous and lead to kidney problems and/or incontinence in the future.
- Regular follow up by the urology team (minimum annually) after discharge is essential to maintaining long term urological health.
- Your bladder activity may change within the first few years post injury.
- The Urology team helps you understand your bladder function following SCI and will work with you to establish a management which is compatible with your lifestyle and condition.

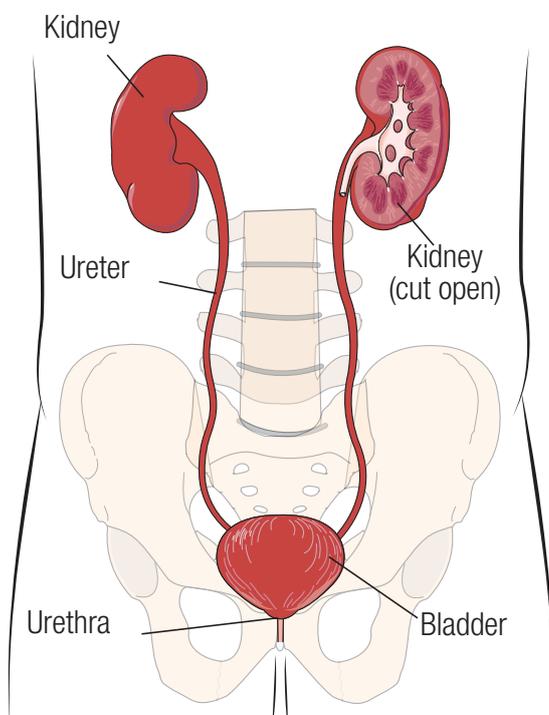
Introduction

Because of the interruption of signals between the bladder and the brain via the spinal cord, the bladder is affected in the majority of patients with spinal cord damage.

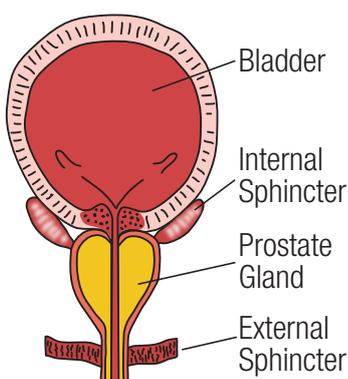
The amount of control you will have over your bladder and the way your bladder behaves now is dependent on the level and completeness of your injury.

The way your bladder will be managed will be a balance between your lifestyle and what's best medically for you in the long term. We need to work closely with you to ensure your bladder management fits into your life, rather than your life revolving around your bladder. While at the same time keeping your bladder and kidneys safe.

Urinary system



Urinary sphincters



Anatomy of the urinary system

Kidneys – Produce urine by filtering waste, such as salt and water from the blood. They are located on either side of your spine at the back of your abdomen

Ureters – Narrow tubes that carry urine from kidney to the bladder

Bladder – A round muscular hollow sack that stretches to store urine. The amount of urine the bladder can hold varies but on average is 500mls.

Detrusor – This is the muscle of the bladder that contracts causing your bladder to empty

Urethra – This carries the urine from the bladder out of the body. It is approx 20cm long in males and 4cm long in females.

Sphincters – These are muscles that tighten to keep you dry and relax when you pass urine. You have two in the urinary system

1. Internal urethral sphincter – This is located at the neck of the bladder where the urethral opening is. You do not have voluntary control over this sphincter.

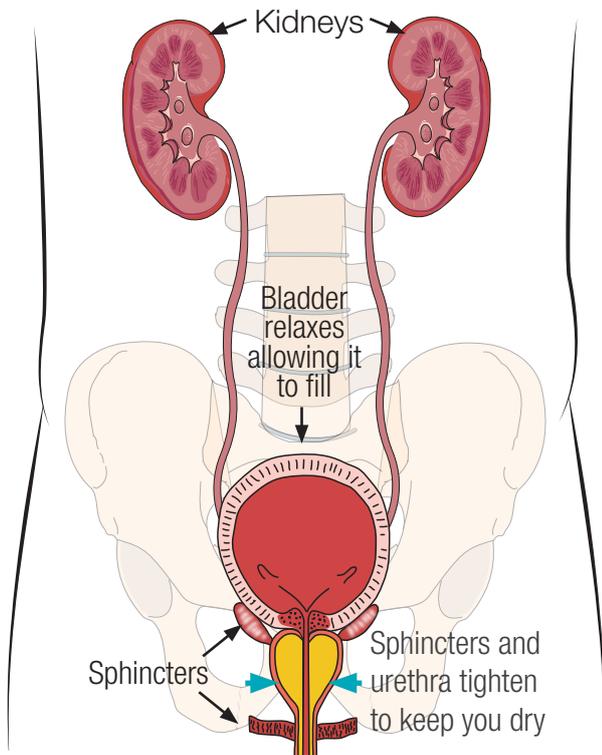
2. External urethral sphincter – This sphincter sits below the internal urethral sphincter and is controlled by the brain. This is the one you relax when you empty your bladder and contract to stop urine flow. Normally you do have control over this sphincter.

Prostate gland (in men only) – This wraps around the urethra and if it is enlarged it can partially block the urethra leading to problems passing urine.

Nervous control of the urinary system

The nerves that control the bladder are at the lowest point of the spinal cord (Sacral nerves).

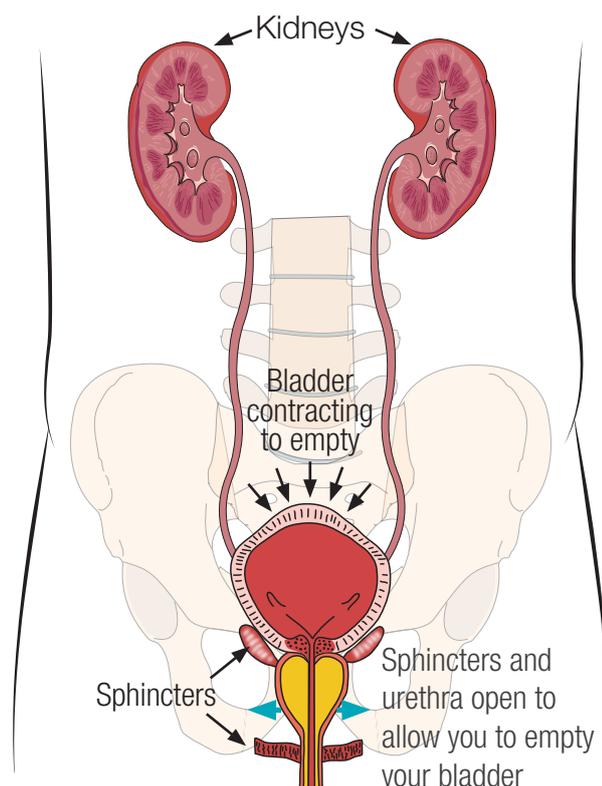
The nervous system (brain and spinal cord) controls when and how you urinate, and there are two key issues, storage of urine and emptying of the bladder.



Storage of urine

The bladder normally relaxes itself whilst it is filling with urine. This action is controlled by the nerves at approximately T12 level of the spinal cord.

At the same time the internal urethral sphincter contracts to keep you dry. Both these actions are involuntary, i.e. they happen automatically. When the spinal cord is intact the bladder remains relaxed until it is full. At this point stretch receptors in the bladder send a message to the brain via the 'reflex voiding centre' at Sacral nerves 2, 3 and 4 in the spinal cord. This message informs the brain about the full bladder that also wants to automatically contract. The brain however has the ability to override this action if it is not ready, e.g. you are not near a toilet. This reflex voiding is what you see in babies, who's brains are not developed enough to stop them urinating.



Emptying of the bladder

Voluntary and involuntary actions allow you to empty your bladder. As above when the bladder is full it communicates this to the brain. When you are in an appropriate place your brain then sends a message back down the spinal cord to initiate voiding. This causes:

1. The bladder to contract to expel the urine.
2. At the same time both sphincters relax allowing urine to pass freely.

How does my spinal injury affect my bladder?

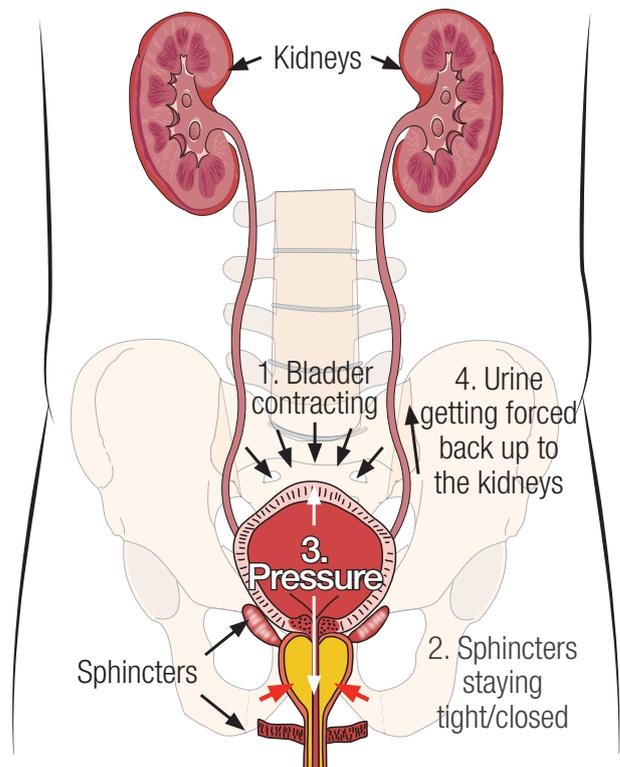
In the initial stages after spinal cord injury your body experiences a period of spinal shock. During this time the bladder becomes 'flaccid'. That is, it will do nothing and continue to fill up without emptying. It is important during this time to ensure the bladder is regularly emptied to prevent it being damaged due to being over-stretched. This is usually done by the nurses inserting a catheter initially, and then later on relying on periodic/intermittent catheterisations. The way your bladder functions and reacts will depend on the location and severity of your spinal cord damage.

This means that everyone's bladder will act differently. However, we can tell you the different ways your bladder may react and why.

Upper motor neuron bladder

- This is also referred to as reflexic, spastic, overactive, hyper-reflexic or automatic.
- Generally occurs when your spinal injury is at or above T12-L1 level and the bladder reflexes are still intact.
- This means that when your bladder fills up, instead of holding a volume of approximately 500mls it will contract at lower volumes automatically as the brain is unable to tell it not to. The bladder tries to inform the brain of its fullness but is stopped because the message cannot go past the damaged area of the spinal cord. This message will then short circuit/reflex back to the bladder causing it to contract. This may cause incontinence. The increased contraction of your bladder is called neurogenic (pertaining to the spinal cord) detrusor (bladder muscle) overactivity (contract more than normal).
- The other problem which can occur is that the sphincters stay tight when the bladder contracts preventing urine from flowing freely. When this happens the pressure inside the bladder goes up. Like if you were squeezing a balloon that was tied off. If this happens the urine may go up the ureter back to the kidneys. If this continues, it puts the kidneys in danger of being damaged. This is called Detrusor Sphincter Dyssynergia (does not occur together).

Detrusor sphincter dyssynergia



Lower motor neuron bladder

- This type of bladder generally occurs when the spinal cord damage is at or below T12-L1 level. It is here the one cord splits into bundles of nerves called cauda equina (it looks similar to a horses tail).
- It is often called flaccid, floppy or areflexic.
- This means the bladder will not contract no matter how much you fill it up.
- If you overfill your bladder you may be incontinent and the urine may go back to the kidneys causing them damage. So it is important not to overfill your bladder.

Mixed bladder

- Depending on the extent of nerve damage it is possible to have a mixed bladder.
- This mean you may have more than one thing happening to your bladder. This occurs especially if you have an incomplete injury. Try to think about this from a sensory (feeling) and a motor (movement) perspective. You may or may not get a sensation of fullness (sensory), likewise you may or may not have any control over your ability to pass urine (motor).
- If you have a mixed bladder your management will be based on presenting symptoms.

Tests to assess bladder function

Bulbocavernosus reflex test – This test is performed by nursing / medical and/or urological team to detect the presence of intact reflex activity through the sacral nerves which control your bladder, bowel and sexual function.

Renal ultrasound – This is performed in the Xray department. Pictures of your bladder and kidneys are taken to monitor for any abnormalities. You will have one performed soon after being admitted as a baseline scan to compare future ones to. After you go home the urology team will want you to continue to have a yearly ultrasound to make sure everything is ok and prevent any problems.

Urodynamics – This will be performed approximately 12 weeks after your injury to allow time for spinal shock to resolve. Once you are discharged, depending on the long term bladder management you opt for, you may need to have urodynamics regularly to monitor for changes or complications. See Urodynamics fact sheet.

Kidneys, ureters and bladder (KUB) Xray – This is an Xray of your kidneys, ureters and bladder. It may be done for many reasons, the most common being to look for kidney or bladder stones.

Fluid management

Fluid management is an important part of good bladder management.

In the initial stages following your spinal cord injury your fluid intake may be restricted. This is to enable us to know when your bladder needs emptying to prevent over filling it. After all, what goes in must come out.

Once you have decided on which long term bladder management you wish to have and it has been implemented these restrictions will stop. It is then important to drink at least 2L of water a day to ensure adequate flushing of the kidneys to prevent urinary tract infections and stone formation. How you manage this fluid will depend on the long term bladder management option you decide on.

Complications

Urinary Tract Infection (UTI)

This is when you have an infection in your urine. It may be only in your bladder or it may travel to your kidneys in which you may become very ill. Recurrent UTI's can lead to permanent kidney damage or formation of stones in your bladder or kidney, so it is essential you are able to identify them early and know what to do.

Signs and symptoms of a urinary tract infection

- Feeling unwell
- Increased incontinence
- Offensive or smelly urine
- Cloudy or sedimented urine
- Blood in urine, or pink tinged urine
- Decreased skin tolerance, ie your skin may mark easily
- Sweating / shivering
- Increased spasm
- High temperature / fever
- Pain on passing urine or in kidneys (if you have sensation)
- Increased frequency of needing to pass urine (if you have sensation)

What to do if you think you are getting a urinary tract infection

- Take a urine sample to your doctor.
- Increase your fluid intake to try and flush it out. Note- you will need to empty your bladder more regularly if you are drinking more to ensure you do not over fill your bladder.
- Discuss with your doctor whether you need to start taking antibiotics. Note - you should NOT take antibiotics unless your UTI is symptomatic. Some symptoms, such as cloudy or smelly urine, do not need to be treated with antibiotics.

Renal calculi

Also known as renal stones, calculi are hard masses (stones) that form from mineral deposits in the urine. Crystals that separate from the urine build up to form a stone. The best thing you can do to prevent them is to stay infection free and ensure you drink continuously throughout the day (at least 2L per day) to ensure the kidneys stay well flushed.

Haematuria

This is blood in the urine. It can mean many things but the most common is that you have a UTI. You should contact your GP if you experience this.

Reflux

When urine travels back up the ureters from the bladder to the kidney. Usually because of bladder overactivity or a blockage in the urinary system.

Hydronephrosis

This is when the inside of the kidneys become swollen due to reflux. This can often develop without any signs but will be picked up on ultrasound. It can lead to other problems and most seriously kidney failure.

Autonomic Dysreflexia

See section on Autonomic Dysreflexia.

Factors affecting bladder management

1. Fluid intake – It is very important that you drink 2L of water a day. This ensures adequate flushing of the kidneys to help prevent UTIs and stone formation. Depending on your management it will also help prevent complications such as catheter blockages.
2. Regular emptying – If urine remains in the bladder for long periods of time the bacteria in it are allowed to multiply more rapidly which may lead to infection. Hence you should always empty your bladder as completely as possible every 4–6 hours.
3. Hand function – ability to hold a catheter or empty a bag independently
4. Level and completeness of injury – type of bladder.
5. Wearing a brace – this may delay commencing of a management
6. Bladder action – this can only be confirmed with urodynamic studies
7. Previous urological history or problems
8. Lifestyle
9. Gender and age
10. Your choice!

Ongoing follow up

Follow up is important to ensure we identify and address problems early. We like to see you at least every 12–18 months after discharge to make sure everything is going well. It is your responsibility to ensure you are seen by the urology team regularly and to contact the outpatients department to arrange an appointment when required.

If you are unable to attend an appointment, it is essential that you call the appropriate department to cancel and reschedule, so it can be filled with other patients waiting to be seen. If you do not turn up to two consecutive appointments (2 years), you will be discharged from our care and will need to be re-referred by your GP.

Finally, it is essential that you have a permanent GP. This enables us to communicate effectively and ensure efficient care for your future. Your GP will be your first contact for any problems and it is very important that he/she is involved in your on-going care.

Your urology team contacts

Spinal Urology Clinical Nurse Consultant – Tel: 6152 8605

Urodynamics Department – Tel: 6512 7307

Monday to Friday

Contact

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