
Tutorial

for

Continence Systems



SAUER
CONTINENCE

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In 1976 he launched Manfred Sauer GmbH.



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About incontinence and bladder paralysis

Introduction

The following tutorial on incontinence is mainly addressed to people with neurogenic bladders and more specifically spinal injuries, but it will also be of interest to people with a whole range of other conditions. The quality and length of life of people with spinal injuries and many other conditions that affect continence depends on maintaining a healthy bladder and healthy kidneys. It is therefore important to be aware of the basic functions and damage that can be done to the urinary tract. This information will compliment advice from your doctor or specialist nurse and enable you to take responsibility for your own health.

A glossary of terminology appears below for your reference.

The function of a healthy bladder

Bladder function can be divided into two phases. First, there is a permanent filling and retaining phase, where urine, produced in the kidneys is stored in the bladder over a period of several hours. This process is involuntary and there is no noticeable build-up of pressure in the bladder (intra-vascular pressure).

As soon as the bladder is filled to a trigger point which will differ from person to person, a message is sent to the bladder centre (the sacral miction centre) and from there to the control centre in the brain – both involve the spinal cord (see Fig. 1). The information is then registered as a urinary urge only, as the bladder still has an adequate reserve capacity left.

As soon as the time and place for voiding the bladder is reached, a signal runs in the opposite direction and releases a voluntary voiding phase (micturition). If necessary, one can release urine without having a urinary urge.

The command to micturate starts a very complicated procedure. The bladder muscle (the detrusor) contracts increasing the pressure in the bladder. In males, the pressure within the bladder can reach approx. 50 cm H₂O. An extremely complex, but very finely harmonised autonomic mechanism ensures, practically simultaneously, that the bladder neck opens, the external sphincter relaxes and the muscles of the pelvic floor give way to free passage of urine. Both the bladder muscles and the sealing mechanism (sphincters) must work well together (Detrusor-Sphincter-Synergy), so that the urine can freely flow through the urethra.

The following points are vital to assure trouble free micturition:

- The nerves between the bladder, the lower bladder centre and the brain must be intact so that the nerve impulses can be passed on.
- The bladder must be intact.
- The inner and outer sphincters must stand up to the bladder pressure.

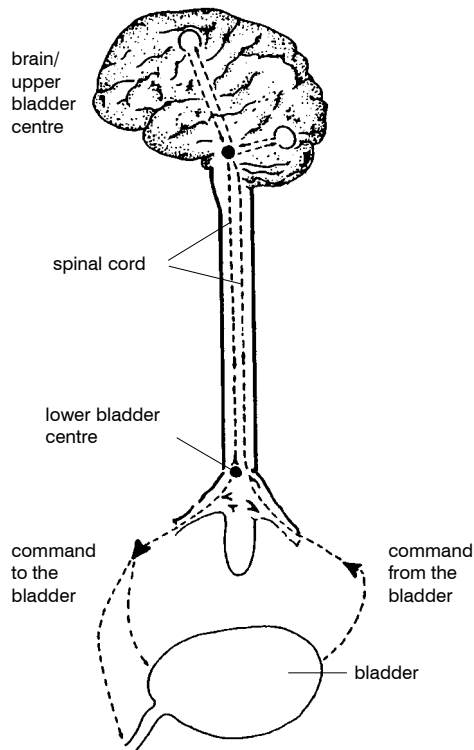


Fig. 1 – The diagram shows bladder drainage by the central nervous system

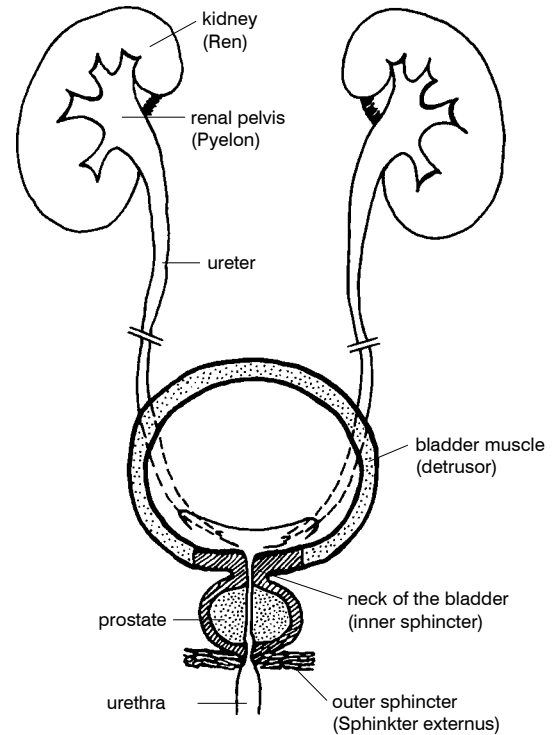


Fig. 2 – Urinary tract (male)

Incontinence

As soon as a disorder occurs at one stage of the process, incontinence is the *likely* result. Incontinence means unintentional loss of urine. The control over bladder voiding is disturbed through some cause or another.

Apart from urinary incontinence, there is also bowel incontinence which is not covered here.

There are various types of incontinence, dependent on where the defect or disorder occurs or why it occurs:

- **Stress incontinence:** see following pages.
- **Overflow incontinence:** Loss of urine caused by loss of bladder muscle function – see limp bladder paralysis.
- **Urge incontinence:** Normal filling of the bladder, with an inability to hold back urination once the desire to void is felt. The Urge Syndrome is the combination of frequency, urgency and nocturia.
- **Reflex incontinence:** see following pages.

The forms of incontinence described here are those that are mainly the result of neurogenic bladder conditions such as spinal cord injury and Multiple Sclerosis.

Reflex incontinence – the spastic bladder

The main reason for this form of incontinence is damage to the spinal cord in the pathway between the brain and the lower bladder centre. This damage can be caused by trauma such as spinal injury with paralysis, or may be the result of illness (e.g. multiple sclerosis) or congenital condition such as spina bifida. The signal that the bladder is full arrives in the lower bladder centre but cannot be sent further. This first signal can sometimes be faulty as it does not always relate to the filling of the bladder, but can also be released through other stimuli. This gives rise to the command occurring too early or too often. Because the brain cannot intervene, a “short circuit” in the lower bladder centre occurs, and this causes a reflex, spastic and unintended – often unnoticed – release of urine.

In more favourable cases, the bladder fills well, the interior bladder pressure is raised moderately, and the reflex activity leads to a residual-free bladder voiding several times within 24 hours. This is a well balanced reflex bladder.

Further improvement is possible by triggering this reflex through bladder training (tapping, triggering-off or knocking). In this case the individual can decide when to void the bladder (see bladder training on following pages).

Unfortunately, such cases are rare and an unbalanced reflex bladder is more common. This occurs when the finely balanced relationship between inner bladder pressure and the sealing mechanism is disturbed (*Detrusor-Sphincter-Dys-Synergy*). The pressure caused by the reflex action of the bladder does not lead to opening of the sealing mechanism but to contraction. This results in the bladder (muscle) working even harder to try and overcome the contraction. Bladder pressure is raised once again, and this can lead to the following problems:

- increased amounts of residual urine
- dilation of the bladder wall (diverticle, pseudo-diverticle)
- reflux of the ureters and kidneys
- reduction in the capacity of the bladder
- infiltration of urine into the internal male genitals
- advanced reduction of kidney function

All of the above increases the existing risk of infection.

For people with a spinal cord injury above the level of T/6 there is the added risk of complications that many healthcare professionals outside the specialist area of Spinal Injuries may not be aware. Depending on the severity of the problem, the affected person experiences cramps and varying degrees of related disorders of the autonomic nervous system, ranging from *unbearable outbreaks of sweating, flushing of the face, neck and shoulders and goose pimples, to dangerously high blood pressure in spinal cord lesions above the T6 level* “*Autonomic dysreflexia or hyper-reflexia*” which, if unchecked, can lead to fits, a cerebral haemorrhage (stroke) and death (From Spinal Injuries Association – Moving Forward, April 1995).

In addition, the people concerned cannot even help themselves, because the triggering or knocking of the bladder increases the symptoms and dangers.

Treatment possibilities

It is the aim of every treatment to reach a nearly residual-free drainage, with as low as possible inner bladder pressure. For the treatment, there are two possibilities, either the reduction of drainage resistance or the reduction of activity of the bladder muscle. Depending on the case, the two methods can be combined.

Depending on the severity of the case, drainage resistance can be reached by the following methods:

- relaxed sitting position (in a wide sense a relaxed body)
- intermittent self-catheterisation
- slitting the sealing mechanism (sphincterotomy)
- enlarge the bladder by positioning a section of the bowel into it (augmentation cystoplasty)

The over (hyper) active bladder muscle can be treated by medication such as oxybutynin. These drugs increase bladder capacity by diminishing unstable detrusor contractions, but all may cause dry mouth and blurred vision and in extreme cases may precipitate glaucoma. For some time now, in cases of over active reflex voiding, it is possible to improve the capacity function and bladder voiding through surgery. The nerve routes that convey the level of the capacity and provide the reflex are severed (Deafferentation). The nerve routes that register the activity of the bladder are then attached to electrodes. A low pressure reservoir in the bladder is guaranteed through deafferentation, and the bladder can be voided willingly. This means that urine can accumulate in the bladder for a few hours without being disturbed by involuntary reflexes, yet can still be voided voluntary at any time. This large-scale operation is often referred to as a “Bladder Pacemaker”, “Sacral Anterior Root Stimulator (SARS)”, or a “Brindley Operation”. This however is a major operation taking up to 4 hours, with recovery time up to one month. The operation involves cutting certain nerves which may reduce the option open to the individual as new medical advances are made. There are new treatments in magnetic resonance currently being developed which may eventually replace this SARS operation. Seek specialist advice to determine if you are suitable for such an operation and its potential advantage/disadvantage on your lifestyle.

The limp (Acontractile) bladder

When the damage to the spinal cord lies below the area of the lower bladder centre (T12), the reflex nervous system is also damaged, so the bladder has no muscle tone and doesn't contract to empty automatically. This causes a limp bladder, which leads to high quantities of residual urine and increased risk of infection. As a result, stimulating the bladder is impossible because the micturition reflex cannot be released. It is possible to attempt to void the bladder through careful application of pressure, but this can cause the inner bladder pressure to rise dangerously.

In this situation, residual and pressure free drainage can be achieved through intermittent self-catheterisation.

Stress incontinence

Even when the bladder is emptied at regular intervals without the application of pressure and with no resulting residual urine, it does not mean that continence is guaranteed.

The muscle tone of the sealing (sphincter) mechanism can give way or be damaged by earlier surgery so that loss of urine may occur even through minimal strain. Bladder strain – resulting in the involuntary release of either small or large amounts of urine – can be caused by changing position in the wheelchair, or even by sneezing or coughing.

If this form of incontinence cannot be treated with medical aids, there remains the possibility that a false sphincter – the “Scott sphincter” – can be implanted.

Urological diagnosis

This summary clearly shows that bladder function is extremely complicated, so while we hope that these notes will be of use to you in your own self-monitoring, it is essential you do this in conjunction with regular consultations with your specialist and continence adviser.

For Men: Benefits of the urinary condom catheter

Although treatment – surgical or otherwise – can attain significant results, full continence is seldom achieved. The problem is how to deal with partial incontinence or in the case of someone who is fully continent but with impaired mobility, to reach the toilet in time? For men, the urinary condom is still the best solution because it enables you to lead a full social life. Only someone in this position can appreciate the benefits – both freedom and confidence – that a condom catheter can provide.

The condom catheter is a solution for people with neurogenic bladders such as spinal injuries, Multiple Sclerosis etc. in the sense that other therapies do not always lead to continence with confidence. For men that have had prostate treatments or removal, some incontinence usually remains to a greater or lesser extent. Experience shows that the condom catheter is a satisfactory solution in most cases.

Unlike permanent catheters or disposable/reusable pads which are still widely used, it is clear that the condom catheter causes fewer problems when dealing with incontinence due to old age, such as skin care issues with pads and recurrent infections with catheters.

For Women: What are the alternatives?

Assuming a full urological investigation has ruled out pelvic floor exercises as a method of achieving full continence the choices women have are limited to:

- intermittent catheterisation
- urethral or suprapubic permanent catheterisation
- relying on urinals (see URIBag F & URIfem described later in this tutorial)
- bladder training may be possible in some cases (described later in this tutorial)
- “Sacral Anterior Root Stimulator (SARS)” or a “Brindley Operation”. (see treatment possibilities earlier).

Reusable or disposable pads for men and women

These are basically specialist diapers for people over the age of 4 years old, designed to soak up leaks as efficiently as possible whilst trying to keep the layer next to the skin as dry as possible to avoid irritation. Odour and social confidence will always be a problem with this type of continence management. Unfortunately they are often the first choice by some healthcare professionals. We believe this should be the last resort as pads certainly do not inspire social confidence and can lead to all sorts of skin problems and sores, particularly when the person has little or no sensation, as may be the case with conditions such as spinal injuries.

Recommended reading

For the general public:

Moving Forward – The Guide to living with Spinal Cord Injury published by the Spinal Injuries Association (SIA). The guide is about helping people with spinal cord injury regain their independence.

(SIA contact details at the end of this tutorial) A4 binder also available on CD ROM

Promoting Continence and Product Awareness – free booklet on products produced by Promocon & Ricability (Available directly from Promocon contact details at the end of this tutorial)

Childrens Continence Products – free booklet on products for children produced by Promocon & Ricability (Available directly from Promocon contact details at the end of this tutorial)

For the Healthcare Professionals:

Nursing for Continence – C Norton, Beaconfield Publishers, Beaconfield

Clinical Handbook for Continence Care – B Roe, K William's, Scutari, London

Incontinence - Abrahams P, Khoury S, Wein A 1999 Health Pub Ltd Plymouth

Promoting Continence – Getliffe and Doleman, 1997 Bailliere Tindall

Good Practice in Continence Service published by the Department of Health April 2000 is available on the internet: www.doh.gov.uk/continenceservices.htm

Contact the Continence Foundation (contact details at the end of this tutorial) for an updated list of publications, papers and fact sheets and useful addresses for Patients, Carers and Relatives.

Glossary of terminology

Autonomic Dysreflexia	Spinal Injuries only. A sudden life-threatening surge in blood pressure. In Tetraplegics and paraplegics with lesions of T6 or above, an overfull bladder is the commonest cause to trigger this reaction. Once the cause is removed, i.e. bladder emptied, the danger is over.
Autonomic nervous system	The part of the nervous system responsible for the control of bodily functions that are not consciously directed.
Continence Adviser	Specialist nurse or physiotherapist with expert knowledge on helping people with continence problems.
Detrusor	Bladder muscle
Dys-synergy	The forces working against one another (see synergy)
Incontinence	Involuntary loss of urine
Intermittent self-catheterisation	Emptying of the bladder by passing a special catheter into the bladder. Once the bladder is emptied, the catheter is removed.
Intravesical	Pressure within the bladder
Micturition	Emptying of the bladder
Neurogenic	Pertaining to the nerves
Pseudo diverticle	Widening of the bladder
Reflux	Flowing back of urine from the bladder into the ureters and kidneys
Residual Urine	Measure of a post-micturition, urine (whats left in the bladder after emptying)
Sacral miction center	Lower bladder centre in the transitory area between the thoracic and lumbar vertebrae

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- Sphincter Sealing muscle (inner and outer)
- Suprapubic catheter Permanent catheter which will be passed into the bladder through the abdominal wall. Requires a minor outpatients surgical procedure to initially fit. There is evidence that points to them being less prone to bladder infections than ureathral catheters. Also preferred by many people who have an active sex life
- Synergy The working together of forces (see dys-synergy)
- Urethral catheter A permanent catheter which will be passed into the bladder through the urethra (the usual channel for urination)
- Trauma Injury through force e.g. an accident

Keeping kidneys and bladder healthy

To keep the kidneys and bladder in good health, it is vital to maintain disciplined self-monitoring procedures.

Always remember:

- Fluid intake – drink enough water to produce 1.5–2 litres of urine daily. Ideally the urine should be a light straw colour.
- Urinary output – keep a record of
 - **Voiding intervals**
 - **Quantity** due to bladder capacity and residual urine
 - **Appearance:** cloudiness
concentration
odour
as a sign of infection
 - **pH** – There are test strips (litmus paper) available to establish the pH of your urine. The urine should test with an acid value somewhere between pH 5–6. To increase the acidity, there are medications you can take or try the natural products available such as rosehip tea, natural blackcurrant juice, cranberry juice, cranberry juice concentrate tablets and Vitamin C tablets. It should be noted that high concentrations of acidic substances can cause indigestion and even ulcers in extreme cases.

If any irregularities occur, consult your doctor and increase your fluid intake – drink tea and plenty of water to stimulate your urinary flow. Many doctors allow consumers who are willing to take control of their bladder management to have a stock of antibiotics (chosen by the doctor based on their infection history). Rather than wait for an appointment to see a doctor or get a specimen of urine analysed, they can then start a course of antibiotics immediately after taking a specimen. It is important to be responsible in the use of antibiotics and always get a specimen analysed to monitor exactly what is going on.

To prevent bladder infection, there is a whole range of medications as well as homeopathic products. Cranberry juice or cranberry capsules/tablets and vitamin C are reported to help prevent bladder infections as they make the urine more acidic and thus less hospitable for bacteria. Consult your continence specialist for details of such treatments.

Sudden headaches could be a sign of increased bladder pressure or even infection. Do not try and self-diagnose – consult your doctor or urology specialist for advice.

Bladder training

Depending on your medical condition you may be suitable for bladder training. Many ladies have to rely on this form of bladder management as they may not wish to be permanently catheterised and find the use of pads distasteful and intermittent catheterisation difficult in the real world. You should discuss the type and scope of bladder training (also known as triggering) with your consultant or urology specialist, after completing a urodynamic examination.

If your doctor advises you carry out bladder training, men are advised to do it whilst wearing a sheath drainage system and women with a suitable absorbant pad. Bladder training helps:

- decrease dependancy on a sheath drainage system
- increase and perfect the automation of the bladder
- reduce distention of the bladder
- reduce the amount of residual urine

Intervals for bladder training

Even people who have partial or no sensation learn to notice changes in their bodies which act as a sign of a full bladder. These signs are important for people who rely on bladder training or intermittent catheterisation to manage their bladders. Such signs are:

- goose pimples on your back, arms, face or forehead
- sweating in specific places such as at the hairline on your forehead
- pins and needles, itching on the back of your arms
- feeling of pressure/tension in the head
- Muscle spasm in legs and abdomen

You can organise the intervals between training by these signs. If no signs occur, you should perform bladder training every 4 hours (except during the night).

Risks

The unbalanced pressure of the bladder (Detrusor-Sphincter-Dys-Synergy) can increase through bladder training and cause long-term damage to the bladder tissues and ultimately damage the kidneys.

Intermittent Catheterisation

You can prevent these risks linked to bladder training by intermittent catheterisation. The catheterisation ensures a pressure and residual-free bladder drainage. If you can't or don't want to perform this procedure yourself or have it done by a carer throughout the day, you should do it at least twice a day (morning and evening). Wheelchair users should take their feet off the footrests and push their pelvis as far forward as possible in order to straighten the urethra as much as possible before passing the catheter.

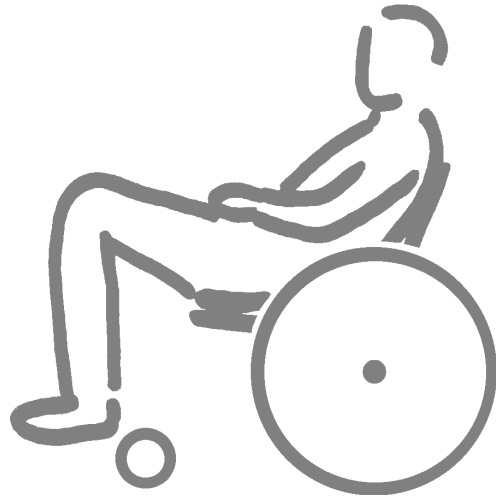
Performing bladder training

You can use individual stimuli to release the reflexes (the trigger mechanism) by:

- Knocking on the bladder
- Stimulating the skin on the abdomen, the external genitals, or the inside of the thigh
- Rectal manipulation (stretching of the anal sphincter)

Make sure you are in relaxed position!

- When sitting: Push the pelvis as far forward as possible
- When lying: Lie on your side with your knees bent



Those with a limp bladder paralysis should empty the bladder by intermittent catheterisation. Pressing with your hands on the bladder can cause long term damage.

Useful tips about living with a urine drainage system

Essential supplies - Small bag

We advise anyone who wears a urinary system to carry a small bag in case of an emergency. This bag should contain:

Urinary sheath Users

- 2 urinary sheaths
- 1 tube of skin adhesive which you have already tried for adhesion quality if you are not using a self-adhesive sheath.
- 1 leg bag
- 1 small plastic bag with an elastic band – if the outlet tap starts dripping, you can put the plastic bag around the tap and fasten it with the elastic band.

If the urinary sheath starts leaking

The urinary sheath may start leaking while you are wearing it, e.g. a small hole appears. After drying the spot, spread some adhesive over it (see reference to the small bag) and glue some of the urinary sheath film together. This should last until you are able to change the urinary sheath in a quieter place.

Urethral/Suprapubic catheter users

- Syringe to empty balloon of old catheter to enable its removal if it gets blocked
- Spare catheter and accessories required to fit the catheter in case the existing one gets blocked. Most people or their carers can be taught how to fit a catheter. To rely on calling out a healthcare professional should your catheter get blocked in the middle of the night or when on holiday may not be practical
- Catheter valve or spare leg bag should there be a problem with the leg bag you are wearing.

Techniques for people with limited finger movement to apply a urinary sheath

Many tetraplegics do not have the 'third hand' needed to slide the urinary sheath into the connecting tube. You can solve this problem by using a piece of tubing.

From the inlet tube of a bed bag, cut a piece of approx. 30cm long (with or without adapter). You can re-use this piece time and time again. Slide this piece of tubing (side of the adapter when used) into the connecting tube of the urinary sheath. To make the tubing slide easier, just wet the tubing or adapter slightly at the point of entry. Hold the end of the tubing with your teeth just above the penis so that you can unroll the urinary sheath with the two balls of your thumbs.

When you have finished with the adhesion procedure and waited for a while (about 5 mns), blow the urinary sheath through the piece of tubing to check that:

- the adhesion is secure
- the urinary sheath does not leak

You can then remove the piece of tubing and slide the connecting tube of the urinary sheath (wet slightly also) into the inlet tube of the leg bag.

The whole procedure takes place while you are sitting with the leg bag ready to be fitted and your trousers undone. To help this procedure, Rolli-Moden trousers have an extra long zip that extends into the gusset.

There is a video (Order no. 99.921) which illustrates this procedure.

Adhesion with continual incontinence

Continual incontinence means that urine drips constanly through the urethra. As a result, the adhesion area is always damp and this always leads to a reduction of the adhesion strength. You should therefore void the bladder by bladder training or catheterisation beforehand. The few remaining urine drops can be stopped temporarily by holding back the penis. Then, there is enough time to dry the skin and go through the adhesion procedure.

The SAUER Comfort self-adhesive sheaths can help in this instance as the adhesion procedure is shorter. These sheaths are put on the penis tip, then unrolled and adhered at the same time.

Emptying the urine bag while away from home

This is the situation: you want to empty while in a car, at the office or on a plane whitouth attracting everybody else's attention.

Before leaving home, slide a latex coupling tube (Order no. 55.38) into the inlet tube of a bed bag. You then put them into a non-transparent plastic bag. You can also use the connecting tube of a urinary sheath as a joint (simply by cutting the connecting tube from a urinary sheath).

To empty the leg bag, slide the coupling tube into the outlet tap of the leg bag and open the tap. As soon as the leg bag is empty, close the outlet tap and remove the coupling tube. To make sure that the bed bag is leakproof, you can either tie or bend the inlet tube and move the (blue) cap of the bed bag adapter over the knot. Later, you can put the bed bag into the plastic bag and dispose of it.

You can also empty the leg bag into the URl bag (a pocket sized urinal that folds away into a small case). The URl bag which takes up hardly any room when empty can hold up to 1.1 litres (almost 2 pints). The URl bag has a cap which closes securely, thus ensuring no leaks when full. You can then empty in an appropriate place at your convenience.

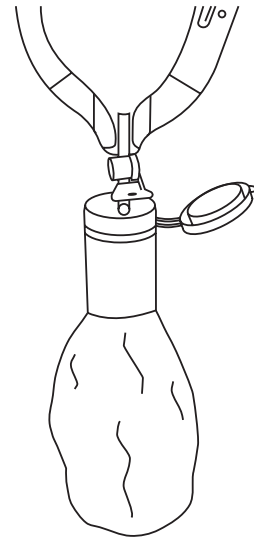
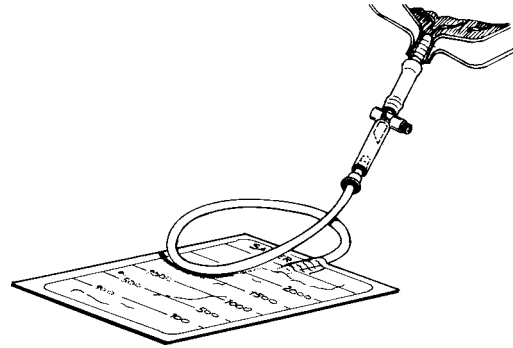
Taking leg bags off temporarily

From time to time (e.g. in the bath or sauna), you may want to remove the leg bag from the urinary sheath and leave it off for a while. Although leg bags are fitted with a non return valve, it is possible that when lying flat for sometime, a small quantity of urine comes out of the inlet tube.

There are two ways of dealing with this. Often, it is enough to stand the inlet tube up against a wall. The second alternative is to 'close the system' – you add a latex coupling tube to the inlet tube and then join it to the outlet tap. You can order individual coupling tubes (Order no. 55.38) or, even simpler, cut the connecting tube of a urinary sheath.

The last 100ml – who needs socks?

If you choose to wear a leg bag that is drained at the ankle, it does not mean you have to wear socks with long trousers in hot weather. A good tip is to turn the outlet tap assembly upwards and tuck it inside the lower leg bag strap snugly so it is fixed in this position. This effectively gives you a "reserve" tank of about 100mL. So if you forget to keep a watch on how full the bag is getting, you can "untuck" the tap assembly which gives you that little bit of extra capacity and time to find somewhere to empty the bag.





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