

# Bladder Inconveniences

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## Why should polio survivors experience bladder inconveniences?

In order to see how the scene could be set for polio survivors to be at risk of having bladder inconveniences we have to return to the acute phase of polio – is there evidence it affected the bladder and voiding process? From the epidemics of acute polio voiding disturbances are reported with a prevalence of around 20% (1-4), the prevalence being higher among adults than among children. The problem was by far urinary retention but incontinence also occurred as did serious urinary stasis and urinary stones. Symptoms usually lasted for a week, but permanent damage occurred in 15% of the cases.

Living with polio, however, also increase the risk of having bladder dysfunction. In order to understand that we will have to have a look at bladder anatomy, bladder function, nerve supply and factors affecting the voiding process.

## Normal bladder function and voiding process

The bladder is a balloon situated in the pelvis. The detrusor muscle is situated in the bladder wall and by contraction it is able to create pressure and empty the bladder for urine. A successful voiding requires, however, that the sphincter relaxes at the same time. The sphincter is part of the pelvic floor and supported by it. The bladder has two functions: storage of urine controlled by the sympathetic nervous system and voiding controlled by the parasympathetic nervous system. In the baby these two functions automatically follow each other: the bladder fills, when it is full it empties. The first years of life the central nervous system matures and makes it possible for the individual to be conscious of the bladder and to control the voiding process. However, voiding is influenced by several additional factors other than intact nerves and muscles: Urine production, bladder capacity, opportunity, disease, upbringing, culture, habits, and psychological factors contribute as follows:

Urine production: depends on the amount of fluid in the body, consequently on the intake of fluid. The production is in general 1-1.5 litre per 24 hours, and the normal voiding volume 200 cc. Urine production is normally reduced at night under the influence of antidiuretic hormone.

Bladder capacity: normally the first desire to void is felt at about 200 cc, but suppression of voiding can be held to up to half a litre or more. A small capacity gives frequent voiding, and a large capacity – with some exceptions – gives infrequent voiding.

Opportunity: If you do not have nearby toilets with easy access you might come in trouble. Certain occupations as f. ex. bus drivers are at known risk of have problems on this account.

Habits, upbringing, and culture: your decision of when is it appropriate to void is influenced by these factors.

Psychological factors: stress and excitement gives a tendency to void while engagement tends to make you forget to void.

Disease: infection and tumours may give frequent voiding.

## How do polio survivors have an increased risk of bladder dysfunction ?

Impaired muscles and nerves: a weak detrusor muscle may result in incomplete voiding, leaving residual urine behind. The bladder is as a consequence soon full again, and voiding becomes frequent. It may become so frequent that incontinence will be the experience. At worst there is no detrusor muscle contraction at all and a total retention of urine develops.

A weak sphincter/pelvic floor results in impaired ability to keep tight and dripping of urine will occur, especially in connection with jumping, laughing and coughing (stress incontinence).

The autonomic (sympathetic and parasympathetic) nervous system, that controls body functions other than striated muscles, may be imbalanced and give rise to difficulties in inhibiting voiding desire (urge-incontinence) (parasympathetic preponderance) or difficulties in initiation of the voiding process (sympathetic preponderance).

Disease: urine is a wonderful media for bacterial growth and sets the scene of frequent infections

Upbringing: in the forties and fifties the attitude in good nursing was to keep things on a fixed schedule, and for voiding this meant that children in hospitals were brought up to suppress their need for voiding until it was scheduled. Bad habits and overstretched detrusor muscle fibres could be the consequences.

Opportunity: weak muscles in arms and legs may make it difficult to get to toilet in time to avoid an accident.

Bladder capacity: weak detrusor muscle, hospital upbringing, bad opportunities and habit result in large bladder capacity, where as sympathetic preponderance may give a small bladder volume.

Urine production: in paralysed legs oedema build up during the day. When the force of gravity is reduced in bed, retained fluid is mobilised and excreted, resulting in a larger urine production at night.

### Work-up for bladder dysfunction

Primary work-up: comprises of 3 simple tests and a screening for other diseases. First of all a drinking/voiding chart for three days should be fulfilled by the patient:

Time	Drinking volume	Voiding volume	Leakage/activity
	cc	cc	
	cc	cc	
	cc	cc	
	cc	cc	
	cc	cc	

A measurement of the velocity of the urinary flow is done by having the patient urinate into a flowmeter, and the residual urine (the volume of urine left after voiding) is measured by an ultra sound. Screening for disease is done by urinary stick (blood, infection), vaginal-rectal examination and ultra sound.

This work-up is often enough to get to diagnosis and treatment. If further work-up is needed the patient should be referral to an urologist for a full urodynamic investigation.

### Treatment

General advice: intake of liquid should be around 2 litres a day, less in the evening or before critical events (as going out). Voiding should also be performed before critical events (as going out or to bed) and with a frequency that gives a voiding volume of 2-300 cc with around 3 hours interval in the day time. Easy access can be important, in order to reach the toilet in time from the first desire to void until voiding is possible. This can implicate adjustments of both house and clothing.

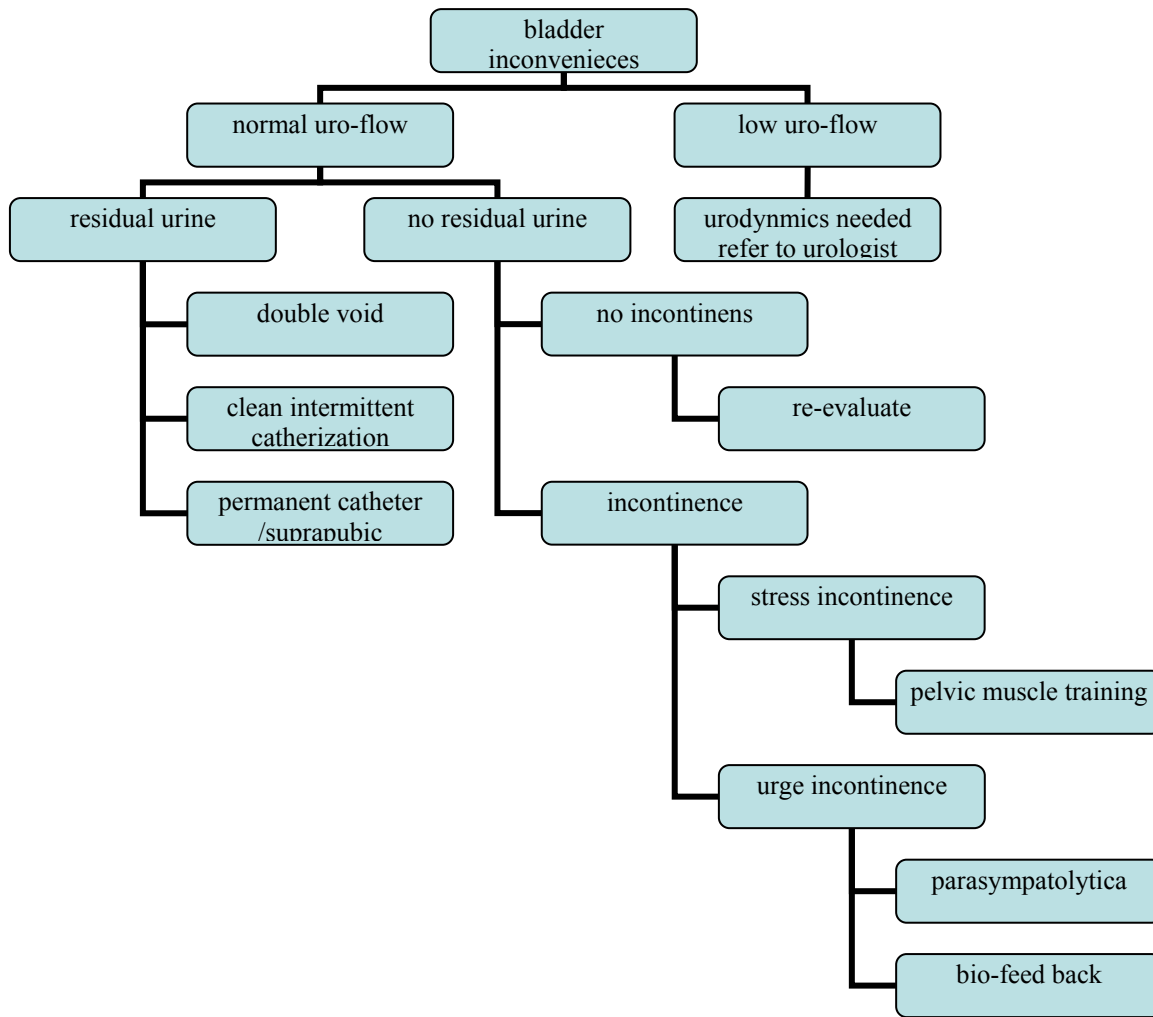
Oedema: If the patient presents with oedema of the legs and the voiding chart shows a large urine production at night, oedema can be prevented in the daytime by elevation of the legs and/or an elastic stocking, and supplemented by a mild diuretic at 5 p.m. when necessary.

Residual urine: first step in the treatment of incomplete emptying (residual urine > 100 cc) is to double void (i.e. void once again at the same visit to the toilet). If this is not sufficient Clean Intermittent Self-catheterisation should be initiated. Most patients are able to do that with the supervision of an experienced urological nurse. The last choice is permanent a catheter, preferably as a suprapubic catheter inserted above the pubic region. This way of insertion gives less discomfort especially in connection with physical activities.

Urinary flow: if the urinary flow is low (< 15 cc/sec) or if it is impossible to obtain volumes > 100 cc the patient should be referred to a full urodynamic investigation.

Incontinence: stress incontinence may be treated by training of the sphincter/pelvic floor, where as urgeincontinence may be treated by bio-feed back and/or parasympatolytica (Darifenacin, Oxybutynin, Solifenacin, Tolterodin).

**Summery of work-up and treatment for bladder inconvenieces when other disease has been excluded**



**References:**

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