

## Bladder Factsheet

### Introduction

Bladder issues are common and can affect people of all ages, yet they are often ignored because many feel embarrassed discussing them. But with the right information and support, these problems can usually be managed and, in most cases, effectively treated.

### 1. Types of Bladder Problems

Bladder symptoms can range from being mild and occasional, such as needing to urinate more frequently, to more challenging issues like incontinence or difficulty emptying the bladder.

#### 1.1 Overactive Bladder

When an individual presents with urinary issues such as leakage or difficulty urinating, they are often asked by their healthcare professional if they can control their bladder. This is important because some neurological conditions impair the ability to hold urine.

- **Urinary urgency:** A patient may report needing to rush to the toilet shortly after feeling the urge to urinate. Normally, people can delay urination for a reasonable amount of time without it interfering with their activities. However, in some cases, the urge becomes so strong that they must immediately stop what they are doing and find a toilet. This symptom is known as urinary urgency.
- **Increased urinary frequently:** Some patients report needing to urinate more frequently than usual. There isn't a strict "normal" number of times a person should urinate each day, as it varies depending on factors such as fluid intake, the type of drinks consumed, and environmental conditions like temperature. However, many people typically urinate around four to six times a day. If someone notices they are going more often than their usual pattern, this is described as increased urinary frequency.
- **Nocturia:** Waking up at night to urinate can become disruptive. A person who previously slept through the night may begin to wake once or twice to urinate, something that can become more common in your 50s or 60s. Research suggests that waking two or more times per night is particularly bothersome and can significantly affect quality of life. Clinically, waking more than once at night to urinate is referred to as nocturia.
- **Urinary incontinence:** If a person is unable to control their bladder and experiences leakage before reaching the bathroom.

When symptoms such as urinary urgency, increased frequency, and, in some cases, incontinence occur together, they are collectively referred to as an **overactive bladder**. Essentially, it means the bladder is not functioning as it should and seems to act on its own.

From a physiological perspective, the bladder is lined by a muscle that normally works only when it is appropriate to pass urine. In an overactive bladder, this muscle is working involuntarily, pushing urine out when it shouldn't. For example, even while sitting and focusing on something else, such as chatting with friends, the bladder may suddenly signal the need to urinate. These involuntary contractions lead to what we describe as overactive bladder symptoms.

Some individuals with overactive bladder symptoms experience a sudden intense urge to urinate that leads to involuntary leakage which is called **urinary incontinence**.

It's important to understand that an overactive bladder is not specific to neurological conditions such as post-polio syndrome. While a neurological condition is a common cause in clinical practice, there are many other possible causes. In fact, overactive bladder is quite common in the general population, affecting roughly one in five people (about 17%). Symptoms can vary widely, from mild urgency or slightly increased frequency to more troublesome urgency and leakage. In other words, it exists on a spectrum, and not all cases are linked to neurological conditions.

For example, in men, an enlarged prostate is a very common, age-related change, particularly after the age of 50. As the prostate enlarges, it can obstruct urine flow, forcing the bladder to work harder to empty. Over time, this extra strain can cause the bladder to become overactive, leading to symptoms such as urgency and frequency. This is just one example of how overactive bladder can develop independently of neurological conditions.

There is also a condition known as **idiopathic overactive bladder**, which simply means that no clear cause can be identified. A significant number of people in the community experience symptoms of overactive bladder, such as urgency, frequency, or leakage, without any identifiable underlying reason. When patients attend hospital with these symptoms, part of the evaluation involves looking for possible causes. If, after thorough investigation, no cause is found, the condition is termed *idiopathic*.

## 1.2 Underactive Bladder

In addition to storage symptoms, some people experience difficulties with passing urine.

- **Urinary hesitancy:** There is a delay in starting the flow despite feeling the urge to urinate. Once the stream begins, it is normally steady and reasonably strong, but in some cases, it may be weak or intermittent, stopping and starting during voiding.
- **Straining to pass urine:** Some individuals may need to strain, using their abdominal muscles to initiate or maintain urination.
- **Sensation of incomplete emptying:** Other people may feel that their bladder has not fully emptied, even after they have finished urinating.
- **Double voiding:** Another symptom is where a person urinates, then shortly afterward feels the need to go again, and passes more urine. This can also indicate that bladder emptying is not functioning normally.
- **Urinary retention:** Some individuals may be unable to empty their bladder completely, leading to a build-up of urine, a condition known as urinary retention.

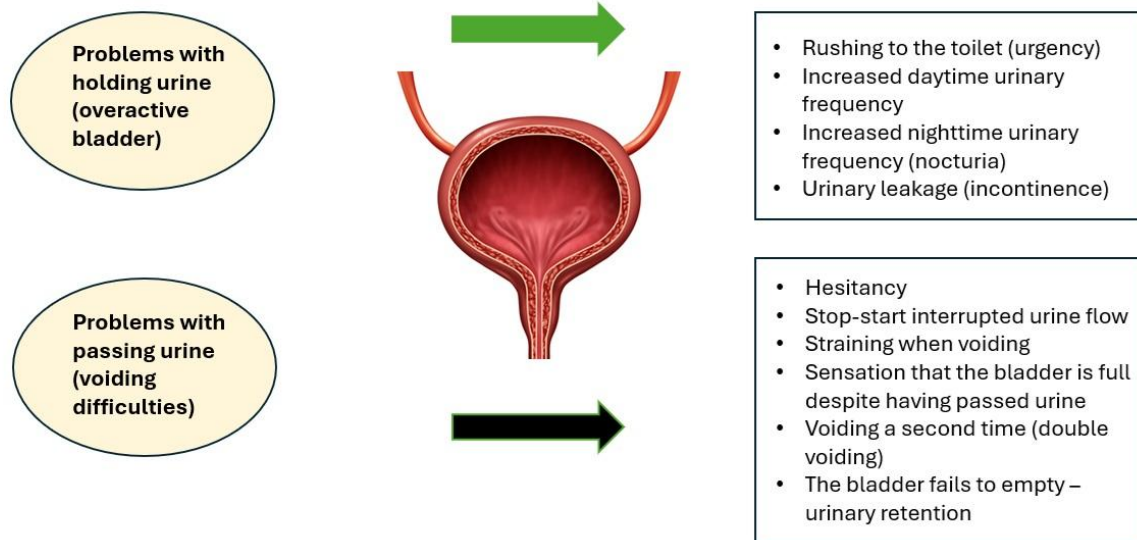
Symptoms relating to storing urine, such as urgency or increased frequency, tend to be noticed quickly. People often become aware something is wrong because they have to interrupt daily activities and rush to the toilet, wake up at night, or experience leakage.

In contrast, problems with passing urine can be much more subtle, especially when they develop gradually. A slow increase in hesitancy or a weakening stream may go unnoticed over time, as people adapt to the change. It may only become obvious during a sudden event, such as complete urinary retention, or in situations where comparisons are more apparent, for example, noticing a weaker stream than others in a public restroom.

From a simple perspective, the bladder can be thought of like a pump in a plumbing system. If there is difficulty emptying, it may be due to:

- A problem with the “pump” itself, meaning the bladder muscle is not contracting properly (**an underactive bladder**), or
- A blockage in the “pipe,” such as an obstruction preventing urine from flowing out (for example, an enlarged prostate)

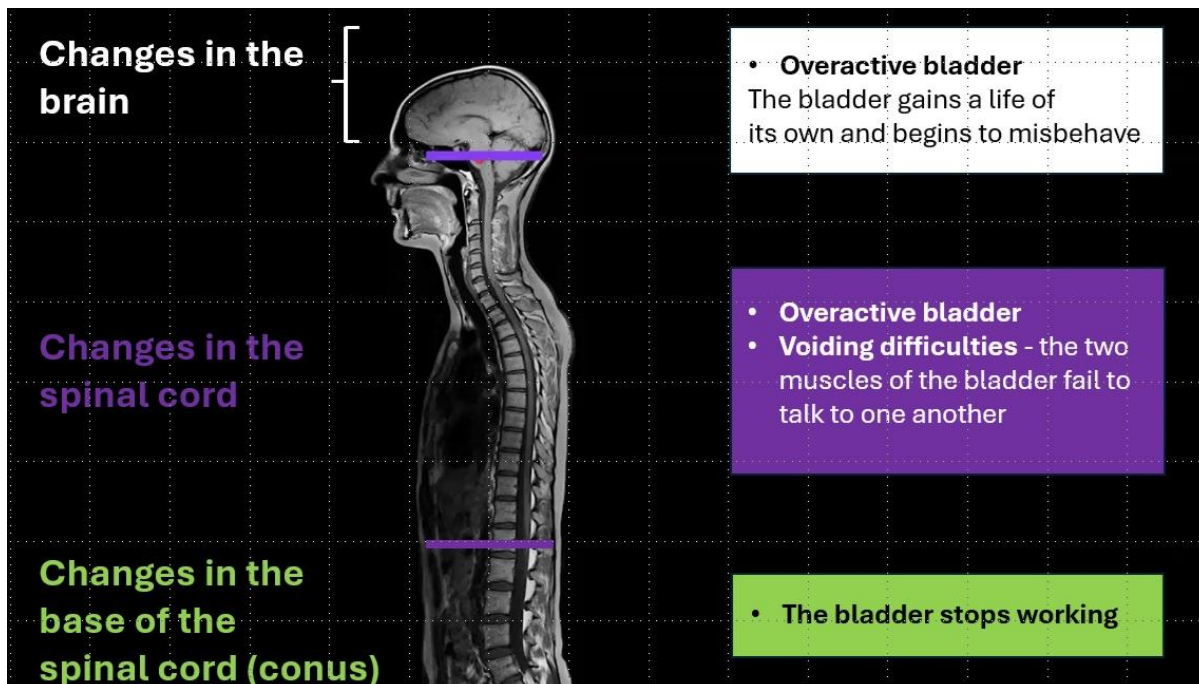
## Urinary problems



## 2. Bladder Symptoms among Polio Survivors

In neurological conditions, the pattern of bladder symptoms often depends on where the problem lies:

- **Brain conditions** (such as Parkinson’s disease or stroke) typically lead to overactive bladder symptoms, including urgency, frequency, and leakage.
- **Spinal cord problems** (such as trauma or multiple sclerosis) can cause both overactive bladder symptoms and difficulty emptying, due to poor coordination between bladder muscles—a condition known as dyssynergia.
- **Lower spinal or nerve root problems** (for example, from a slipped disc or lumbar spinal stenosis) may interfere with bladder emptying. In severe cases, such as cauda equina syndrome, this can result in significant difficulty passing urine because the bladder muscle no longer functions properly.



In people who have had polio, the situation is somewhat different. The virus primarily affects the anterior horn cells of the spinal cord, which control muscle movement in the limbs, leading to weakness and muscle wasting. However, these nerves are not typically involved in bladder control. For this reason, the traditional understanding in medicine is that polio itself does not usually affect bladder function.

There was a survey-based study conducted in Denmark over a decade ago. Questionnaires were sent to polio survivors and in total, 272 people responded.

The survey focused on bladder-related symptoms across a broad age range. Most participants were between their 50s and 70s, although responses included individuals from their 40s onward. Both men and women were included, providing a wide perspective on how bladder symptoms may present in polio survivors.

**Paper link** <<https://medicaljournalssweden.se/jrm/article/view/15870/19702>>

In the study, the researchers didn't just survey polio survivors, they also asked the same bladder-related questions to a group of healthy individuals without a history of polio.

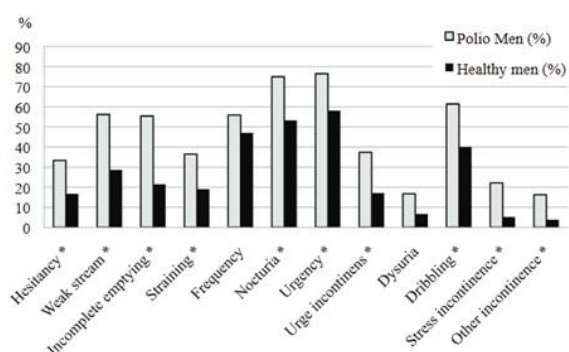


Fig. 1. Symptom prevalences among men with polio and men in the background population (8). \*Significant difference between 95% confidential intervals.

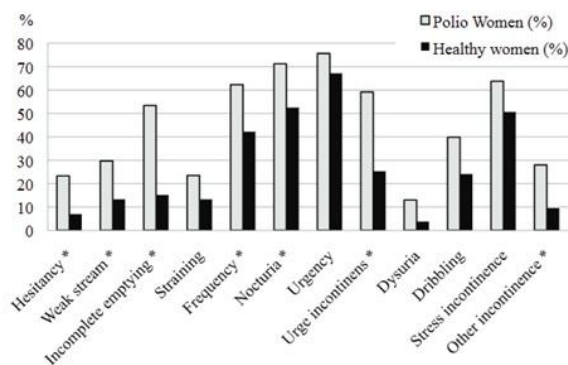


Fig. 2. Symptom prevalences among women with polio and women in the background population (8). \*Significant difference between 95% confidential intervals.

SOURCE: *Medical Journals Sweden*

Kay L, Bertelsen M. Bladder symptoms among polio survivors. *J Rehabil Med.* 2013 Jun;45(6):560-4. doi: 10.2340/16501977-1153.

From the Danish Society of Polio and Accident Victims, Rødovre, Denmark

<https://medicaljournalssweden.se/jrm/article/view/15870/19702>

The medical paper written about the study shows a graph (see above), the black bars represent responses from the healthy group, while the grey bars represent responses from people with polio. What stands out is that, across every symptom measured, individuals with polio reported a higher frequency of bladder problems than their healthy counterparts. This pattern was consistent for both men and women.

In fact, the difference was marked, almost double in many cases. In other words, polio survivors were about twice as likely to report urinary symptoms compared to individuals without polio. This highlights that, although polio itself is not traditionally thought to directly affect bladder function, bladder issues appear to be significantly more common in people who have had polio.

Building on the symptoms described earlier, the study shows a clear pattern in polio survivors.

In men with a history of polio, the most commonly reported symptom was urinary urgency, feeling a sudden need to rush to the toilet. The second most common was nocturia, meaning waking at night to pass urine. This is particularly interesting because similar findings are seen in other neurological conditions such as Parkinson's disease, where nocturia is also very common.

Other "storage" symptoms were also more frequent, including increased urinary frequency. In addition, a significant number of men reported "voiding" symptoms such as a weak urinary stream, incomplete bladder emptying, and urinary hesitancy. Some also described post-void dribbling, where small amounts of urine leak out after finishing urination.

A similar pattern was seen in women with a history of polio, with urgency, frequency, and nocturia again being prominent. However, there were some differences between men and women. Men more commonly reported weak stream, hesitancy, and incomplete emptying compared with women. In contrast, women reported higher rates of stress incontinence.

It's important to clarify that stress incontinence refers to leakage of urine during physical exertion, such as coughing, sneezing, lifting, or jumping, and is unrelated to psychological stress. It occurs when the pelvic floor muscles are unable to adequately support the bladder outlet under pressure.

Several factors may explain why stress incontinence is more common in women, including childbirth-related pelvic floor changes and hormonal changes after the menopause, where reduced oestrogen levels can weaken pelvic support tissues.

Overall, the findings suggest that people who have had polio, experience a higher burden of both storage and voiding urinary symptoms compared with those without polio. While polio is not classically thought to directly affect bladder function, it is possible that subtle effects on pelvic floor or related neuromuscular control may contribute.

### 3. What is 'normal' bladder function?

The normal adult bladder capacity is typically around 450 to 500ml. In terms of urinary frequency, most adults pass urine approximately six to seven times during the day. Night-time

frequency varies with age, and it can be normal for some individuals, particularly as they get older, to wake once during the night to urinate.

Fluid intake also plays an important role, with a general daily requirement of up to about 2 litres. When bladder symptoms begin to affect quality of life, individuals are often advised to maintain a fluid intake of around 1.5 to 2 litres per day and to distribute fluids evenly across the day. It is also helpful to avoid drinking fluids two to three hours before bedtime to allow the bladder to empty before sleep.

#### 4. Diagnosis and assessment

In a clinical assessment a detailed history of bladder symptoms will be recorded. This includes asking the patient:

- how often do you pass urine during the day?
- how often do you wake at night?
- What is your fluid and caffeine intake?
- Do you consume drinks that may irritate the bladder, such as caffeinated or carbonated beverages?
- How do your symptoms affect daily life?
- Are there any recurrent urinary tract infections (UTIs) which may suggest incomplete bladder emptying?

Investigations are used to better understand bladder function. Some or all of the following investigations may be arranged:

**Uroflowmetry:** a common test where patients are asked to pass urine into a specialised commode that measures flow rate. A bladder scan is then performed to assess how much urine remains afterwards. Because the test environment can sometimes be unfamiliar or anxiety-inducing, it may be repeated in a more comfortable setting to ensure accurate results.

More specialised tests include:

**Urodynamic studies:** the bladder is filled with fluid to assess its pressure and behaviour during filling and emptying.

**Neurophysiological testing:** to evaluate nerve function in the pelvic floor.

#### 5. Management of Urinary Incontinence

Bladder symptom management usually begins with conservative approaches. This includes lifestyle modification such as adjusting fluid intake, diet, and alcohol consumption, managing constipation, and supporting weight management.

**Pelvic floor physiotherapy:** a key part of treatment, particularly for women. Assessment of pelvic floor function may include examination and targeted questioning, followed by guided exercises. A specialist pelvic floor physiotherapist can provide structured rehabilitation, including exercises to strengthen and relax the pelvic floor, improve bladder control, and support bowel function, including techniques that can help with constipation.

**Pelvic floor exercises:**

[https://youtube.com/playlist?list=PLazCbfp\\_tqxyrhTV2Spp3E\\_sjK57Py5Lg](https://youtube.com/playlist?list=PLazCbfp_tqxyrhTV2Spp3E_sjK57Py5Lg)

**Behavioural interventions:** aim to prevent the bladder from becoming overly full and to reduce urgency episodes. Instead of waiting until the sensation becomes severe and risks leakage, patients are encouraged to follow a planned schedule for toilet visits. A common starting point is to gradually increase the interval between voiding to around three to four hours, with regular trips to the toilet at these intervals.

**Timed voiding and prompted voiding:** involve using an alarm or reminder system. For example, after going to the toilet, a patient may set a timer to remind them to void again after three to four hours, rather than relying solely on the sensation of urgency.

**Bladder retraining:** includes education about normal bladder function and structured programmes to gradually improve bladder control over time. Patients are supported with clear schedules and ongoing guidance.

**Medication:** there are several oral medications available that can play an important role in managing bladder symptoms, and there are other treatment options such as Botulinum toxin injections into the bladder wall and electrical stimulation therapies, including stimulation of the nerve behind the ankle (tibial nerve stimulation), which can help regulate bladder activity.

In more complex or resistant cases, specialist treatments such as bladder Botox injections may be offered. These decisions are usually guided by a specialist urologist, who can assess the individual and recommend the most appropriate options based on the severity and type of bladder dysfunction.

**Clean intermittent self-catheterisation:** if the bladder is not emptying adequately, a small catheter may be recommended, that can be passed into the bladder to drain the urine at intervals during the day. Patients are carefully supported and educated in this technique.

## 6. Summary

When there are bladder problems, don't assume it's directly related to what's happened from the polio; "common things are common." It could be that the bladder problems are unrelated.

Ask your GP to refer you to a local functional Urologist who understands the bladder in terms of continence and also the relationship with the pelvic floor and the prostate. Always mention you have a history of polio in case there is a connection.

If the Urologist suspects your problem is something neurological, only then should you be referred to a Neurologist with a special interest in uro-neurology.

## 7. Questions and Answers (Q&A)

***Q. On days when my lower back pain is worse, I notice increased urinary urgency and occasionally some incontinence when walking or moving. The back pain seems to be linked to the way I walk. Do you have any advice?***

A. It's quite interesting this pattern is sometimes seen in people with spinal problems. There does appear to be a link between flare-ups of back pain and worsening bladder symptoms. The exact mechanism isn't fully understood, partly because the nerve pathways involved are different, but one possible explanation is "crosstalk" between nerve signals. In this situation, sensory input from the spine and lower limbs and signals from the bladder travel through nearby spinal pathways and may interact, leading to overlapping or "crossed" signalling. This can result in increased urgency and frequency during periods of back pain flare-ups.

Clinically, it's also commonly observed that when back pain improves, whether through pain relief, nerve blocks, or appropriate medication, the urinary urgency often improves as well. This relationship can therefore be an important part of the history.

In the context of polio survivors, this becomes particularly relevant. Long-standing muscle weakness and imbalance can affect spinal alignment over time, even without surgical intervention. With ageing, there may also be degenerative changes in the spine, such as wear and tear of joints, ligaments, and altered posture. These changes can be more pronounced in individuals with a history of polio due to underlying muscle imbalance and altered biomechanics.

Because of this, it is important to consider whether new or worsening bladder symptoms could be influenced by spinal or musculoskeletal factors. In some cases, addressing the underlying back pain and spinal issues first may improve bladder symptoms, rather than immediately escalating bladder-specific treatments such as medications or Botox.

***Q. I had polio 77 years ago, was diagnosed with ulcerative colitis 50 years ago, and developed prostate cancer about 30 years ago. Does having had polio increase the risk of conditions like these compared with people who have not had polio?***

A. These are three distinct conditions. One is an infection, another is an inflammatory condition in which the immune system attacks the lining of the colon (ulcerative colitis), and the third is a cancer. Each has a different underlying cause. It is therefore most likely coincidental that these conditions have occurred in the same individual.

The important point to emphasise is that people who have had polio can, and do, develop the same range of medical and surgical conditions as anyone else in the general population. That is likely what is being observed here.

***Q. I drink the same amount each day, but my night-time bladder control varies. On some nights, once I take my calliper off, I'm unable to walk and need to use a bottle, which is sometimes nearly full. On other nights, there may only be a small amount of urine. This happens despite having the same fluid intake during the day. Why is this?***

A. We would normally expect a fairly direct relationship between fluid intake and urine output. However, the body does not lose fluid only through the bladder. Fluid is also lost through other routes such as the bowels and sweating.

For example, in hot weather or during holidays in warm environments, more fluid is lost through sweating, so urine output may decrease. Similarly, if someone has diarrhoea, more fluid is lost via the bowel and less is passed through urine.

Where fluid intake and environment are relatively consistent, variation in night-time urine output may be due to fluid redistribution within the body. One common example is ankle swelling (oedema). Fluid can collect in the legs during the day, particularly if someone has been sitting for long periods or has reduced mobility.

When a person lies down at night, this fluid is gradually reabsorbed back into the circulation and then processed by the kidneys, leading to increased urine production during the night. This can result in some nights producing a large volume of urine and other nights much less, depending on how much fluid has accumulated in the legs during the day.

There is also a condition worth being aware of called **nocturnal polyuria**. In general, for someone over the age of 50, we expect around one-third of total daily urine output to be produced at night, with the remaining two-thirds produced during the day. However, in some individuals this pattern shifts, and a larger proportion of urine, sometimes even half or more, is produced during the night. This pattern can vary from night to night.

The underlying causes are usually medical. For example, conditions such as sleep apnoea can increase night-time urine production. Other contributing factors include postural blood pressure changes, ankle swelling (fluid redistribution from the legs at night), diuretic (water tablet) use in the evening, and high fluid intake later in the day or at night.

In these situations, fluid handling in the body is altered, leading to increased urine production during sleep and the kind of variation in night-time volumes you have described.

***Q. I've been living with post-polio for 45 years, and now I'm dealing with post-polio syndrome as well. The bladder problems have been ongoing for a long time. Eventually, the NHS referred me for testing and prescribed medication. It helped at first but then stopped being effective. The dose was increased, which worked briefly, but the symptoms returned again.***

***After that, I was advised to focus on weight management. I reduced my weight from 85 kg to 55 kg, carefully monitored my fluid intake, and even had a hysterectomy. Despite all of this, my bladder symptoms have worsened. I've now been referred for Botox treatment to help with emptying my bladder.***

***I've followed every recommendation, cut out caffeine and fizzy drinks, managed my diet, and made significant lifestyle changes, but things are still getting worse. I want to understand why this is happening.***

A. The overactive bladder is a spectrum, for some individuals it's very mild and the beverages and the bladder retraining measures will be sufficient. But if the overactive bladder is significant and you have overactivity seen in tests like urodynamics, then actually these conservative measures are no longer sufficient. The level of overactivity can fluctuate as well. It sounds like your overactive bladder is quite significant and that's probably why the medications are not sufficient, and therefore you'll need to explore other options such as Botox or this nerve stimulation behind your ankle.

***Q. If the muscles on the polio side are not working, can that contribute to bladder problems?***

A. No, that weakness should not cause leakage, particularly if the poliovirus has only affected the upper limb, the lower limb, or your truncal muscles. Generally those should not result in bladder problems. If the polio did affect the base of your trunk, so essentially your pelvic floor muscles, then you're not able to hold your bladder because it's those pelvic floor muscles that tighten up and allow you to hold your bladder without leaking. It is possible that could be why there is incontinence.

***Q. I've had a very large prostate and in November, I had laser treatment on it. And I've done pelvic exercises, etc. But I'm still peeing 8, 9 times a day. The night times have reduced. Should I go back to my GP and get some medication?***

A. When there's any prostate procedure, the obstruction to the pee is removed, allowing the urine to flow better. But if you've had an enlarged prostate for a number of years, what happens is that the bladder is trying to overcome that obstruction by pushing harder and harder, and over time, that bladder then develops a behaviour similar to an overactive bladder. Now if that has been ingrained for some time, eventually the prostate gets addressed, by laser in your case, but then that overactive bladder doesn't necessarily subside. It might be that the frequent peeing could be because of the previous overactive bladder that was there, that's just become more evident now that obstruction has gone. You should go to your GP, because there are medications and other things that can help with those symptoms. They should also have a look to see if the prostate has been properly removed and the obstruction has been removed.

They will need to do an assessment called a ***urodynamics test*** and you'd be asked to complete a three-day diary. The first stop is to go to your GP and explain this urgency frequency is there.

In the meantime, do some behavioural training in case it's the bladder overactivity which is making you go so many times during the day. Try some exercises to see if you can hold on to that sensation of going to the toilet for at least a few minutes.

***Q. I got polio very young which affected me from my waist down. I was told that I needed to use nappies for a while. Eventually I got better and only one leg was badly affected. With the years, my leg muscles have become weaker and started having some stress incontinence and urgency. Could this also a symptom of post polio?***

A. Yes possibly, pelvic floor muscles could be becoming weaker. However there are different causes for stress urinary incontinence which need to be evaluated. You should discuss your symptoms with your GP.

## Authors

The British Polio Fellowship Expert Panel produced this factsheet.

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## Medical disclaimer

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