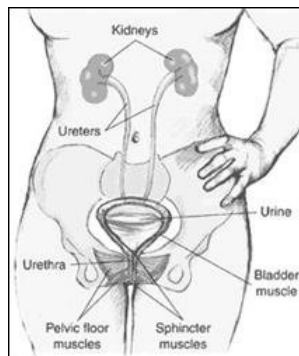


# Overactive Bladder Syndrome

## Introduction: the bladder and how it works

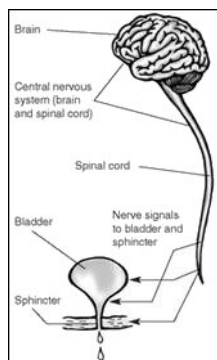
The bladder is a balloon-like organ, with a wall of smooth muscle fibres (detrusor) and elastic connective tissue that can expand and contract. It consists of four layers: the innermost mucosal layer is the urothelium. Beneath the mucosa lies the submucosal layer containing a network of blood vessels, nerves and loose connective tissue known as the lamina propria, below that the smooth muscle detrusor



layer and finally the outer layer. The inner urothelium consists of many tiny folds which allow it to stretch when filling with urine. The function of the bladder is to store urine without leakage and then empty the urine at your convenience when the bladder is full. Most people empty their bladder 4-8 times a day without having to get up in the night.

## Filling, storage and emptying

The nervous system, comprising the brain, spinal cord and peripheral nerves, also plays an important role in this storage and emptying function. When the bladder is full, nerves



in the bladder send a message to the brain to say that it is now time to empty the bladder. The brain then gives you the sensation of needing to empty your bladder. When you have actually reached the toilet and are ready to urinate, the brain sends a message to the sphincter and pelvic floor muscles to tell them to relax and allow the urine out and at the same time tells the bladder muscle to contract to squeeze out all the urine.

## What is Overactive Bladder?

Overactive Bladder (OAB) is not a specific disease but a relatively recently coined umbrella term used to describe a collection of symptoms experienced by the patient. In the past, terms such as unstable bladder or irritable bladder were used to describe these symptoms.

## Symptoms

The symptoms of overactive bladder are urgency, frequency, nocturia, with or without urgency incontinence, in the

absence of any sign of infection or other identifiable cause of the symptoms. Patients may have some or all of these symptoms.

Overactive bladder with urgency, frequency and nocturia (and no incontinence) is currently referred to as OAB dry, while urgency, frequency, nocturia and urgency incontinence are described as OAB wet.

Urgency is a sudden urgent need to urinate which you cannot postpone. Urgency is not the same as the gradual normal desire to urinate when the bladder is becoming full. In a normal bladder, the first sensation of fullness is felt when the bladder is filled to about half its capacity. Urgency may occur when there are just a few drops of urine in the bladder.

Urgency incontinence is urgency followed by involuntary leakage of urine before reaching the toilet. This may be a small loss of a few drops of urine or the bladder may empty completely.

Frequency can be divided into daytime frequency and nighttime frequency (nocturia). Daytime frequency is "the number of voids recorded during waking hours and includes the last void before sleep and the first void after waking and rising in the morning".

Nocturia or nighttime frequency is "the complaint that the individual has to wake at night one or more times to void". (International Continence Society definitions)

Frequency in fact means: urinating more frequently than normal. Up to 8 voids a day is considered to be normal for the average person, but the number of times any individual needs to urinate depends on his/her drinking habits, lifestyle and the climate of the country in which he/she lives. If you drink several bottles of mineral water a day, you may expect to urinate more frequently than someone who drinks an occasional cup of tea. If you live in a tropical country, a lot of the fluid you drink will be lost through sweating.

Frequency is also: urinating small amounts of urine at frequent intervals. Your bladder cannot wait until it is full.

A very small number of OAB patients may feel some pain, but then the question arises as to whether they in fact have OAB or PBS/IC.

## Causes of overactive bladder

Specific identifiable causes:

- nerve damage caused by injury, surgery
- neurological diseases (e.g. multiple sclerosis, Parkinson's disease, spinal cord lesions, spina bifida, stroke)

Other identifiable causes of overactive bladder symptoms include:

- side-effects of drugs
- urinary tract infections
- bladder cancer
- benign prostatic hyperplasia (BPH)
- stones in the bladder
- constipation (stool impaction)
- pelvic organ prolapse
- bladder injury (e.g. car accidents)
- detrusor overactivity (DOA)

Diet and lifestyle may play a role since e.g. spicy and acid food, alcohol and caffeine may irritate the bladder, likewise nicotine from smoking.

Often, however, there is no obvious cause of the symptoms. Much research is currently being focused on the pathways in the central nervous system, including the brain, that control storage of urine and emptying of the bladder. Perhaps the wrong messages are being sent to and from the bladder and the brain.

### **Who gets OAB?**

Overactive bladder affects millions of males and females worldwide. Although OAB can occur at all ages, prevalence increases with age and there is a higher risk in the elderly. Many people with this condition remain undiagnosed and consequently untreated due to their reluctance to seek medical help. Consequently, any statistics may be a gross underestimation of the problem.

### **Impact on the lives of sufferers**

The symptoms of overactive bladder can have a devastating impact on an individual's quality of life. OAB sufferers feel socially disabled, while the impact on their working life may have far-reaching economic consequences. Having to continually rush to the toilet makes many types of job impossible, think for example of train or bus drivers, teachers, etc. OAB seriously interferes with daily work and activities.

The world of OAB sufferers revolves around toilets. They are constantly looking for the next toilet, afraid to go anywhere if they are not absolutely sure of nearby public facilities. This leads to social isolation with sufferers afraid to leave their home, afraid of travelling on public transport without toilets, afraid of being caught in traffic jams in the car, afraid to visit friends or family and afraid of having an "accident" in public. They are embarrassed at having to visit the bathroom so many times in front of other people. They resort to coping strategies which restrict all aspects of their life. They feel social outcasts and many feel a sense of shame and embarrassment, even without incontinence episodes, OAB has a profound impact on their quality of life and the suicide rate is high. Sufferers feel that if they have lost control over their bladder, they have lost control over their life.

Bladder overactivity may have a major effect on sexual relationships and sufferers may find it difficult to discuss this embarrassing problem with their partner. As a result, the partner may be left in the dark as to why their sex-life has ceased.

Embarrassment may prevent them from seeking help from their doctor. There is still a worldwide taboo on talking about bladder problems. Elderly sufferers may also feel that bladder overactivity is a normal part of aging and has to be accepted. Younger women may think that an overactive bladder is a normal consequence of childbirth. They may not realise that OAB is a medical condition that is treatable and may be completely unaware that effective treatments are available that can at least alleviate the symptoms.

Since aging, with its changes in the body, is accompanied by a greater risk of overactive bladder, there is consequently a high risk among elderly people with OAB of falls and consequent fractures in the night when going to the bathroom, as well as urinary tract and skin infections, sleep disturbances and depression. For those who are immobile or arthritic, there is a high risk of incontinence episodes.

### **Impact on society and healthcare systems**

The socioeconomic impact of OAB on society is likely to further increase in the coming years with the phenomenon of the aging population. This will place even more pressure on healthcare systems to seek treatment solutions that are cost-effective, well-tolerated and safe in the elderly population with their specific problems.

### **Diagnosis**

It is important for the patient (or carer) to provide the doctor with full details of any medication being taken (including over-the-counter remedies) and any other medical conditions the patient may have because there may be an identifiable cause of the OAB symptoms which is treatable and curable.

It is particularly advisable for men to contact a doctor as soon as possible because prostate disorders, including cancer, can cause symptoms similar to those of OAB.

Tests may include any of the following: urine tests to rule out e.g. infection, blood tests, X-rays or other imaging, urodynamic investigations and a cystoscopy that allows the doctor to look inside the urethra and bladder.

A voiding diary or bladder diary kept for 24 or 48 hours can provide valuable information on fluid intake and output (amount of urine passed each time) and frequency of urination.

### **Treatment**

The main forms of treatment include bladder retraining, diet modification, drugs, neuromodulation and in the last resort surgery. Bladder retraining

Bladder retraining: a programme of progressive voiding (urination) with increasing intervals between each scheduled voiding over a period of around 12 weeks. This retrains the bladder to hold on longer before urination.

"Kegel" or pelvic muscle exercises can strengthen muscles around the bladder and urethra thereby improving bladder control and reducing urgency/frequency, while at the same time strengthening other pelvic muscles that hold many other organs in place. Exercising pelvic muscles for

5 minutes 3 times a day can make a big difference to bladder control.

(see: [http://kidney.niddk.nih.gov/kudiseases/pubs/exercise\\_ez/index.htm](http://kidney.niddk.nih.gov/kudiseases/pubs/exercise_ez/index.htm))

### **Diet**

Diet modification is aimed at excluding any food or drink that appears to irritate the bladder or which may act as a diuretic to produce more urine, for example caffeine, alcohol, carbonated drinks, acidic food or drink, tomato-based products, chocolate, artificial sweeteners and spicy foods. Since constipation can exacerbate OAB symptoms, ensure that you eat sufficient high fibre food.

Sufficient fluid should be included in the diet to prevent over-concentration of urine in the bladder and constipation in the bowel, but patients should train themselves to drink less before going to bed so as to restrict the need to urinate in the night.

### **Drugs**

Anticholinergic/antimuscarinic drugs are the mainstay of drug treatment for overactive bladder. They work by relaxing the detrusor muscle and reducing abnormal bladder contractions (detrusor instability). However, these drugs tend to have bothersome side effects, the most common of which are dry mouth, dry eyes, blurred vision, headache, constipation, drowsiness, dizziness and palpitations. The newer drugs and once-daily drugs have fewer side effects. Drug therapy maximum dose is usually determined by the patient's tolerance of side effects. Treatment is aimed at reducing symptoms and improving the patient's quality of life.

Commonly used drugs include: darifenacin, solifenacin, tolerodine, trospium, oxybutynin (also available in a patch form) and propiverine.

Problems with these drugs can occur in the elderly who may have concurrent heart disorders, cognitive impairment (memory, concentration problems) and/or other medical conditions and may be taking a whole range of other drugs or over-the-counter remedies. It is therefore very important for patients or their caregivers to provide the doctor with a detailed medical history and a list of drugs or over-the-counter remedies already being taken.

Drugs for depression (antidepressants) that also relax bladder muscle include imipramine hydrochloride, a tricyclic antidepressant. Side effects may include fatigue, dry mouth, dizziness, blurred vision, nausea, and insomnia. Can also result in incomplete bladder emptying (partial retention).

According to recent studies, botulinum toxin A (Botox A) intravesical injections into the detrusor muscle or into the detrusor and sphincter in the bladder has so far produced promising results as a form of treatment for OAB that fails to respond to other treatments. Improvements have been shown to last for 9-12 months in OAB patients. Side effects have included temporary urinary retention (inability to empty the bladder) in some patients.

### **Neuromodulation**

Neuromodulation is treatment that has an effect on the

function of nerves and consequently on the end organ controlled by those nerves.

Sacral nerve stimulation uses electrical impulses to stimulate the sacral nerves that form part of the sacrum located low in the back. These are nerves that influence the bladder, sphincter and pelvic floor muscles. A small device, surgically placed under the skin, sends mild electrical impulses to sacral nerves and can reduce symptoms in selected patients.

Percutaneous Tibial Nerve Stimulation (PTNS) is a neuromodulation system intended to treat patients suffering from urinary urgency, urinary frequency and urgency incontinence. PTNS is a simple form of nerve stimulation via a fine needle inserted near a bundle of nerves located near the ankle. Electrical stimulation is applied to the needle using a low voltage external pulse generator. This sends a mild electric current via the posterior tibial nerve to the sacral nerves that control the bladder function. This form of stimulation is carried out for 30 minute sessions once a week and has been shown to have positive results in OAB patients. After 12 sessions, if the patient's symptoms have subsided or improved by at least 50%, the patient will need a 30 minute stimulation session every 2 to 3 weeks.

Biofeedback can improve pelvic muscles and consequently bladder control by locating the right muscles that need exercising by means of a vaginal electrode.

Other forms of neuromodulation include pudendal nerve stimulation and acupuncture.

### **Surgery**

Surgery is seen as a last resort for severest symptoms that fail to respond to any other treatment. Bladder augmentation is a surgical procedure to increase the size of the bladder if the bladder has become too small (Clam cystoplasty). However, intermittent self-catheterisation may be needed after this operation which is also associated with a number of complications such as production of mucus and changes in the way the bowel functions. Patients who undergo this kind of treatment need follow-up in the form of regular cystoscopic examination of their bladder because of a small potential risk of a malignancy developing.

Other forms of surgery may be used for identifiable causes of overactivity of the bladder such as organ prolapse and stones.

As a very last resort, there is the possibility of a urinary diversion where urine is diverted to a surgically created opening in the abdomen and requires an external urine collection bag. Another form of urinary diversion replaces the bladder with a continent urinary reservoir, an internal pouch made from sections of the bowel or other tissue. This method allows the person to store urine inside the body (in the pouch) until a catheter is used to empty it through a stoma.

### **Overlap of OAB with Painful Bladder Syndrome / Interstitial Cystitis**

The overlap between OAB and PBS/IC is as yet not fully understood and consequently not yet adequately defined.

- both diagnoses are based on symptoms and exclusion of all identifiable causes
- both OAB syndrome and PBS/IC have symptoms of urgency and frequency/nocturia
- the distinguishing feature of PBS/IC is the symptom of bladder pain
- detrusor overactivity, a separate diagnosis, is found in many OAB patients, but not in all
- while most OAB patients respond to anticholinergic treatment, some do not
- some PBS/IC patients have been shown to have detrusor overactivity (estimated 14%)
- some PBS/IC patients may respond to treatment with anticholinergics (as part of combination treatment), but many do not

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