

# Treating urge urinary incontinence

Help is available for patients with urge urinary incontinence, one of the most common bladder complaints seen in general practice. Bladder training programs, with or without drug therapy, and specialist referral in some cases can help motivated patients remain dry.



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Urge incontinence is the involuntary loss of urine with a strong desire to void. The bladder contracts inappropriately without its owner's permission – wrong time, wrong place. Urgency and urge incontinence account for 60% of bladder control problems seen by urologists, geriatricians and GPs, whereas stress incontinence is more common in gynaecological practice. Prevalence of urge incontinence increases with age; up to 25% of men with prostatic outflow obstruction will have symptoms of urge incontinence.

Detrusor overactivity, which underlies urge incontinence, is characterised by phasic (and expulsive) detrusor contractions (Figure 1). These occur inappropriately during bladder filling while the patient is attempting to inhibit micturition. Detrusor overactivity is called detrusor hyperreflexia when there is a neurological cause, and detrusor instability where there is no demonstrable neuropathy. Detrusor instability may be

idiopathic or secondary to bladder outflow obstruction. Rarely, detrusor instability occurs with severe intravesical inflammation. Phasic and inappropriate bladder contractions cause a strong desire to void and motor urgency (urgency for fear of leakage). This must be distinguished from sensory urgency (urgency due to discomfort), characteristic of inflammatory and infective causes of urinary symptoms, such as urinary tract infections.

There is a huge difference between teaching patients to cope with incontinence and curing it. Most incontinence can be cured. Do not start with a defeatist mindset yourself, and do not allow the patient to do so either.

## Patient assessment

Urinary incontinence is a symptom not a diagnosis. The minimum patient assessment should include history, examination, urinalysis, post void

### IN SUMMARY

- Urge urinary incontinence is caused by bladder overactivity and is one of the most common bladder complaints seen in general practice. It involves a strong desire to void with the bladder contracting inappropriately without its owner's permission.
- The condition should not be confused with stress incontinence, which is caused by sphincter weakness. However, the two may occur concurrently, especially in the elderly.
- Patient assessment should include history, examination, urinalysis, post void residual urine and a urinary diary.
- Bladder training programs are the best treatment and can be conducted with or without anticholinergic drug therapy. Management can be in consultation with a nurse continence adviser. If specialist referral is necessary, treatment may include further drug therapy, electrical stimulation, surgery or catheterisation.

residual urine and a urinary diary.<sup>1</sup> The aim of the assessment is to determine the cause of incontinence and whether the predominant problem is bladder overactivity, causing urge incontinence, or sphincter weakness, causing stress urinary incontinence. Treatment for each condition is different.

The patient may mention: a history of being unable to get to the toilet in time; urgency usually associated with frequent micturition by day; and nocturia. Detrusor overactivity is often aggravated by: drinking caffeine or alcohol; silent urinary infection in the elderly; cold and wet weather; running water; putting the key in the front door (latchkey incontinence); or stress and anxiety. There may be a history of nocturnal enuresis in childhood or wetting at school. There is often a positive family history (i.e. one or more parents with enuresis or urge urinary incontinence). Up to 30% of patients with irritable bowel syndrome also have bladder overactivity. Sometimes, there may be large volume incontinence (flooding). Patients may admit they know all the toilets in town and tend to restrict their fluids when they leave home. Many have curtailed some of their activities due to bladder control problems.

Patient examination should include a general assessment to exclude conditions such as neuropathy, Parkinson's disease or multiple sclerosis. Look for abnormal pelvic masses or chronic urinary retention in the abdomen. Part the labia during a vaginal inspection and ask the patient to give three short coughs to check for prolapse, cystocele and obvious stress incontinence. Note coexisting, but not causative, atrophic changes. If found, prescribe a three-month course of topical oestrogen. Longer term oestrogen or hormone replacement therapy may be considered. Leakage, from other than the urethra, suggests a fistula which will need surgical intervention.

Digital vaginal examination should assess bladder neck support and distinguish between cystocele and vault prolapse. Local tenderness of the bladder neck or urethra may suggest intravesical inflammation, especially if there is a history of recurrent attacks of dysuria; urological cystoscopic examination will be required. The patient should be asked to give a pelvic floor contraction to assess pelvic floor strength. This is because pelvic floor weakness and sphincter weakness often coexist, causing prolapse and stress incontinence.

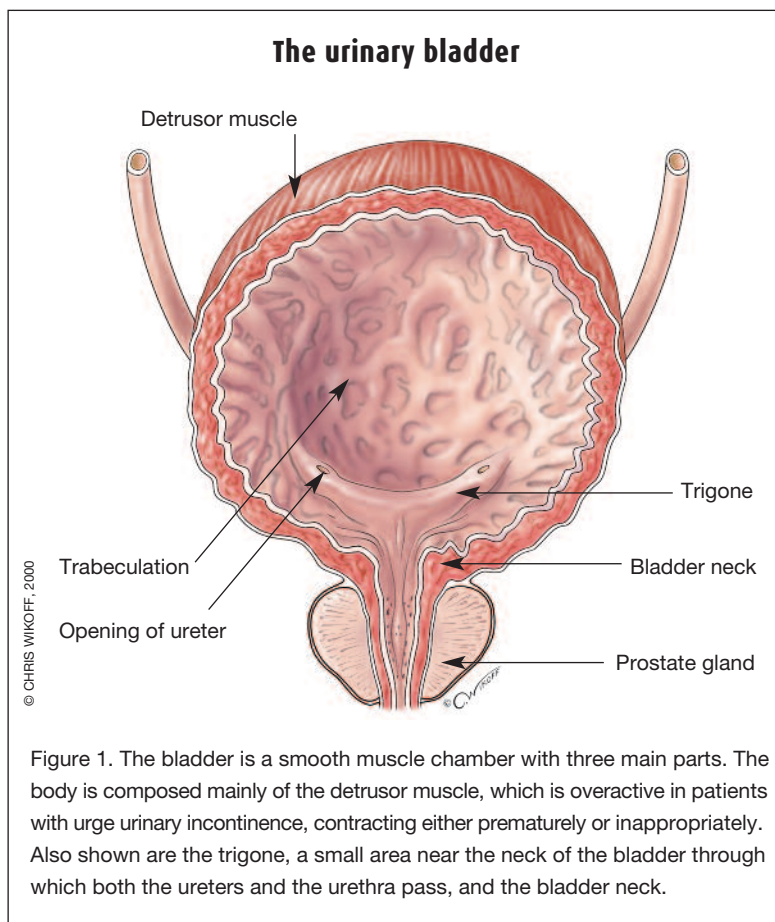


Figure 1. The bladder is a smooth muscle chamber with three main parts. The body is composed mainly of the detrusor muscle, which is overactive in patients with urge urinary incontinence, contracting either prematurely or inappropriately. Also shown are the trigone, a small area near the neck of the bladder through which both the ureters and the urethra pass, and the bladder neck.

A post void residual urine assessment may be made at the same time if the patient has just voided. Alternatively, the patient may be sent for an ultrasound of residual urine, especially if there is a history of incomplete bladder emptying. This is quite important in the elderly as some degree of chronic retention and bladder emptying often produces a mixed pattern of both stress and urge incontinence, a condition present in up to 15% of the frail elderly.

Urine culture is essential to exclude urinary infection, a reversible cause of incontinence, especially in older people, who do not always develop dysuria but merely incontinence.

A urinary diary is a vital part of the assessment. For 48 to 72 hours, the patient records the time of day, volume of urine voided in millilitres, whether there has been incontinence since last voiding, and the circumstances under which it occurred (Figure 2). Look at bladder capacity,

continued

**Patient information**

GPs and patients can order educational leaflets and publications and find out about specialist clinics or nurse continence advisers by ringing the Continence Foundation of Australia's helpline on 1800 330 066.

polyuria and loss of diurnal rhythm.

Urodynamic studies, which measure bladder pressure during filling and emptying, are not essential unless there is real doubt about the diagnosis, or when conservative measures fail and surgery is considered (see 'Specialist referral' below).

**Treatment options**

**Bladder training**

The best treatment for detrusor overactivity is bladder training. This does not mean merely pelvic floor exercises,

although these may be one component. The aim is to teach patients to become dry by using deferment techniques that will enable them to get to the toilet in time. Then, patients learn to increase their functional bladder capacity by progressive distension of the bladder. Bladder training regimens have reported cure or significant improvement rates of about 60 to 70% at all ages.<sup>2,3</sup> They can be administered in the community by a GP working with a community nurse continence adviser, a specialist nurse available in most area health services. Training programs include:

- Timed deferment – patients put off micturition for five minutes every time they get a desire to void. When they can do that, they defer for 10 minutes each time, and so on. Encourage fluid intake to improve functional capacity.
- Timed interval – patients void every 75 minutes this week, every 90

minutes next week, every 105 minutes the week after that, and so on. Avoid fluid restriction.

- Prompted toileting – suitable for mildly demented patients whose carers prompt them every 30 minutes with, 'Do you feel like going to the toilet?' If the answer is 'yes', the carer helps the individual to go to the toilet. Fluid intake moderation may help.
- Timed toileting – suitable for severely demented patients. Patients are taken to the toilet at set intervals, for example every 90 minutes, to avoid incontinence. Fluid intake should be controlled and given at regular intervals.

Self-help books<sup>4</sup> and educational leaflets are available (see the box on this page).

**Drug therapy**

Anticholinergic drugs, if used, are best combined with a bladder training regimen. These agents help reduce bladder overactivity but do not eliminate detrusor instability. The detrusor is a parasympathetically innervated smooth muscle with muscarinic receptors. M2 and M3 receptor subtypes occur in a ratio of 3:1, with M3 being mainly responsible for bladder contractions. For examples of anticholinergic drug therapy, and availability in Australia, see the Table on page 59.

Anticholinergic agents are generally helpful in patients whose problems are well established and who need a little help to develop better bladder habits. The dosage should be slowly reduced as soon as continence is achieved. Some people will need to take anticholinergic agents permanently to maintain bladder control. Others will be able to manage without, once the bladder training course has altered their overall bladder function. However, the neuropathic bladder cannot be trained and all patients with detrusor hyperreflexia (detrusor overactivity associated with neuropathy) will require anticholinergic therapy to improve control.

Figure 2. The patient records the time of day, volume of urine voided in millilitres, any leakage, and comments in a urinary diary. This example shows small volume frequency due to detrusor overactivity.

Date	Time	Interval	Volume (mL)	Comments
10 Aug	9:30am		120	
	11:15		100	
	12:10pm		80	
	3		80	
	5		100	
	6:15		120	Got off bus before
	7		80	journey completed 7pm
	7:30		40	
	9:30		70	
	10:50		50	
11 Aug	11:30		40	
	1am		60	
	1:55		50	
	3		50	
	3:15		40	
	4:10		50	
	5:30		30	
	7:45		100	
	9		170	Minimal fluid intake
	10:15		140	9am-2pm
	12:20pm		60	
	12:40		50	
	1:30		70	
	2:15		70	
	2:45		100	2:45pm Pathology. At
3:25		40	3:30pm went to movie	
4:15		80	Could not hold at 4:15 -	
4:40		40	before movie finished	
5:20		30		

Combination therapy, using oxybutynin (Ditropan) and imipramine (Melipramine, Tofranil) may be necessary to control some detrusor overactivity but there may be side effects. Intravesical instillation of oxybutynin circumvents systemic side effects (e.g. dry mouth, constipation and blurred vision). An aqueous solution containing 5 mg oxybutynin is introduced into the bladder via catheter three or four times daily, usually in patients already managed by either intermittent self-catheterisation or with an indwelling catheter.

In the frail elderly, anticholinergic therapy should be used with extreme caution, starting with low dosage, only slowly increasing. If there is no response within four weeks, medication should be discontinued. In the elderly, drop attacks, confusion, constipation and other side effects are common and chronic retention of urine may occur. The same may apply to patients with multiple sclerosis who tend to be supersensitive to anticholinergic agents. In these people, starting with low dosage and titrating the dose against the therapeutic response is best; watch out for residual urine.

There is a poor compliance rate with all anticholinergic agents (and drop-out rates of more than 30% with older agents) due to side effects, particularly dry mouth and constipation. Many randomised controlled trials have shown a strong placebo effect (more than 30%).

### New agents

Tolterodine is a new, effective anticholinergic agent that has been shown to be equipotent with oxybutynin in randomised controlled trials. Its side effect profile is very much better than other anticholinergics with low drop-out rates (2%), and has been well tolerated in many large studies.<sup>5-7</sup> It will be available in Australia shortly. The dosage is 1 to 2 mg twice daily, but a once daily formulation is under trial.

Trospium chloride is a quaternary

**Table. Drug therapy for urge urinary incontinence**

Drug	Dose	Frequency	Availability
<b>Current preparations</b>			
Propantheline (Pro-Banthine)	15–30 mg	Every 4–6 hours	PBS/RPBS*
Oxybutynin (Ditropan)	5 mg	3 times daily	PBS/RPBS†
Imipramine (Melipramine, Tofranil)	25–75 mg	Nightly	PBS/RPBS
Atrobel	1–2 tablets	3 times daily	Over-the-counter
Donnatab	1–2 tablets	3 times daily	Over-the-counter
<b>New preparations</b>			
Tolterodine	2 mg	Twice daily	Trial access only
Capsaicin	1–2 mmol/L	Instillation into bladder	Hospitals only
Trospium chloride	20 mg	Twice daily	N/A‡
Propiverine	10–15 mg	2-3 times daily	N/A§

\* For detrusor overactivity. †For detrusor overactivity where propantheline has failed. ‡In Australia. §Under trial.

ammonium compound with anticholinergic action. It has some effect on ganglia and has been shown to be effective in detrusor hyperreflexia patients in randomised controlled trials but with relatively benign side effects, possibly related to its low bioavailability.<sup>8</sup> Propiverine is also anticholinergic but with some calcium antagonistic activity with proven effect in randomised controlled trials compared with placebo in patients with detrusor hyperreflexia. However, 20% of patients on propiverine have anticholinergic side effects.<sup>9</sup> Neither drug is yet available in Australia.

Other agents have been trialled in the past 10 years. These include calcium channel blockers and potassium channel

openers, both of which are still under investigation. Beta-adrenoreceptor agonists have been investigated (because  $\beta_3$  receptors are found in the human bladder wall) with conflicting results. Only one study on clenbuterol showed improvement in 15 of 20 women with detrusor instability; it has never been reproduced. The smooth muscle relaxant flavoxate hydrochloride (Urispas) is considered to be of unproven efficacy and is no longer available. Darifenacin is a highly selective  $M_3$  receptor blocker with some promise but still undergoing evaluation.<sup>10</sup>

Capsaicin exerts a biphasic effect on sensory nerves: initial excitation followed by long-lasting blockade. It is thought to exert these effects through



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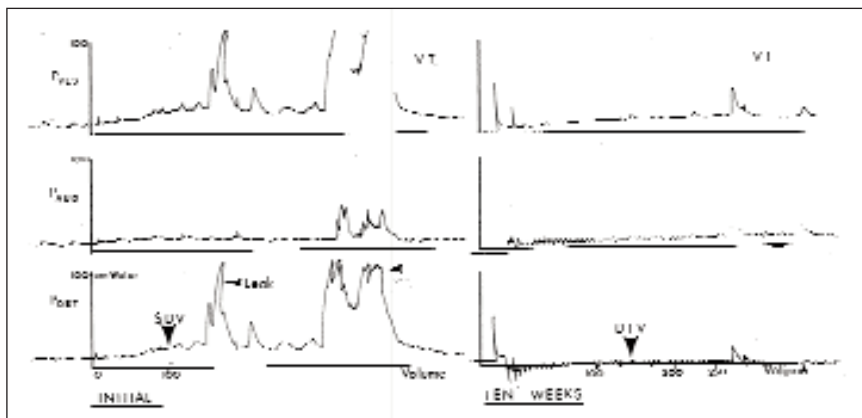


Figure 3. Cystometrograms of a patient being treated by biofeedback bladder retraining. On the left, the detrusor pressure (pdet) shows a series of high pressure unstable contractions after only 100 mL of filling. Ten weeks later, the filling pressures were normal (up to 250 mL). The patient was completely cured.

'vanilloid' receptors found in A-delta and C-afferent fibres. Capsaicin is administered by intravesical instillation at concentrations of 1 to 2 mmol/L and has had beneficial effects on detrusor hyperreflexia for two to seven months.<sup>11</sup> Resiniferatoxin is 1000 times more potent than capsaicin with some effect on bladder function<sup>12</sup> but requires more investigation before it can be widely recommended. The use of both agents is highly specialised.

## Specialist referral

Specialist referral may be required when a three-to-four month bladder training course, with or without anticholinergic agents, does not help the patient. Well motivated patients, even elderly ones, can be helped by further specialist measures. These include transvesical phenol nerve block, neuromodulation, detrusor myomectomy and clam-ileocystoplasty.

The first step will be to confirm the diagnosis with urodynamic or videourodynamic studies. Urodynamic studies involve analysing cystometrograms, which represent changes in detrusor pressure as the bladder fills and empties. A normal bladder does not contract. However, an overactive bladder contracts

inappropriately during filling under provocations such as coughing, change of posture or running taps.

Cystometrograms can also be used to measure the progress of biofeedback training (Figure 3), a technique used by some specialists to augment bladder training. During biofeedback training, the patient's bladder is filled with water or saline, while the patient is shown the pressure rises on a chart or column of lights. The patient is then taught to inhibit bladder contraction by using different deferment techniques.

Videourodynamic studies (Figure 4) involve filling the bladder with a radio-contrasting agent to monitor voiding pressure-flow.

Cystoscopy and cytology may also be required to exclude intravesical inflammation, bladder cancer or carcinoma *in situ*.

## Transvesical phenol nerve blocks

Transvesical phenol nerve blocks is a simple day-case endoscopic procedure, with about a 65% success rate. Aqueous phenol (6%) is injected around the nerve supply to the bladder on each side, with needles passed through the wall of the bladder from the cystoscope to the inferior vesical plexus. The results are apparent

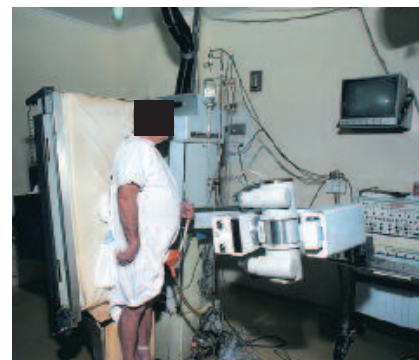


Figure 4. A man undergoing videourodynamic study of his bladder dysfunction. After filling with a radiocontrasting agent, the table is tilted to the erect position. A voiding pressure-flow study is then undertaken.

immediately and with reduction in diurnal frequency and nocturia, and improvement in control. Anticholinergic therapy may still be required, but because the nerve blocks have reduced detrusor overactivity, drugs may be more effective after the injections than before. A 4% urinary retention rate is a transient risk. Transvesical phenol nerve blocks are beneficial for up to two years and may need to be repeated. Failure to respond usually indicates that the injections have gone into the wrong place; injection can be repeated after a six- to 12-week rest. Injections every two to four years can keep some patients under control for many years. Previous pelvic irradiation is an absolute contraindication to this treatment.

## Sacral anterior nerve root stimulation

Sacral anterior nerve root stimulation is a new approach in treating detrusor instability. It uses electrical stimulation of the Spleen 6 (SP 6) acupuncture point in the lower leg just behind the medial border of the tibia and three finger breadths above the medial malleolus. The technique was first shown to work in monkeys during research at

Prince Henry Hospital, Sydney, in 1988, and this is now used clinically in the USA. It is not clear whether electro-stimulation of the acupuncture point is integral to success or whether Spleen 6 acupuncture would do just as well. Further research is needed.

### Neuromodulation

Neuromodulation is a new technique in which the S3 nerve root is electrically stimulated to modify afferent impulses from bladder receptors, thereby reducing bladder overactivity. Response rates are 30 to 50%. Because the technology is expensive (\$10,000), permanent implants are not offered unless a temporary nerve evaluation test is substantially beneficial to the patient. A peripheral nerve evaluation is conducted using a percutaneous wire electrode inserted through the S3 foramen in the sacrum. This is taped into place and connected to an externally worn battery operated stimulator. The patient wears this over a weekend to assess the effectiveness of stimulation in altering bladder activity.

If there is a dramatic response to stimulation – restored bladder capacity, and significant reduction in urinary incontinence or complete dryness – then a permanent implant can be inserted. Neuromodulation is in its infancy and often used in pain clinics. It has not yet been widely used to manage urge incontinence. It is clearly not the first option and very expensive for most patients. However, it is emergent technology that may have considerable promise.

### Detrusor myomectomy

This procedure achieved a short vogue overseas. There are considerable problems in removing the detrusor muscle from the detrusor epithelium, especially in neurogenic bladder patients, and some risk of contracture of the bladder.

### Clam-ileocystoplasty

This bladder augmentation procedure

splits the bladder in two sagittally, like the two halves of a clamshell, and inserts a piece of detubularised ileum. While this procedure dispels and destroys bladder contractility, it also impairs voiding deficiency. Many patients then need to self-catheterise to empty the bladder. This must be regarded as the end of the track for most patients with urge incontinence.

### Urinary diversion

When all else fails and incontinence is severe and disabling, diversion to an ileal

conduit or to a continent urinary diversion may be considered. Every other avenue of approach should be tried first.

### Indwelling urethral or suprapubic catheter

A catheter is never a fit-and-forget solution to detrusor overactivity. Chronic catheterisation is usually considered for people with neurogenic disorders and mobility problems but may be the start of a whole new series of complications including bladder spasms, infections, haematuria, bladder calculi, catheter blockage and catheter bypassing. For some patients, incontinence pads may allow a degree of social continence. Some

men will successfully be able to use a condom catheter and leg bag instead of a standard catheter.

The bladder is still overactive even with a catheter inserted and most patients will need suppressive doses of anticholinergic agents. An 18F silastic catheter with a 5 cm<sup>3</sup> balloon only (to reduce bladder stimulation) is ideal, and is best flushed with oral fluids. Some patients will need prophylactic low dose antibiotics (e.g. nitrofurantoin 50 mg nightly or cephalexin 250 mg nightly). A suprapubic catheter is often better than a urethral catheter, especially in neuropathic bladders in which the urethra is also neuropathic and may become patulous quite readily.

In some patients whose hyperreflexia can be abolished by anticholinergic agents, transvesical phenol nerve blocks or intravesical agents, a catheter may be fitted with a valve. This allows the bladder to fill and empty at the flick of switch, freeing the patient from the nuisance of an unsightly and embarrassing leg bag.

### Conclusion

There are many options for patients with urge incontinence who are motivated and wish to be dry. Most patients can be treated in the community by the GP with a nurse continence adviser.

Anticholinergic agents can augment bladder training and some of the newer agents are clearly better than older and 'side effect burdened' anticholinergics. Intravesical instillation of anticholinergic agents or vanilloid receptor blockers may be effective when oral agents are ineffective or not tolerated. Even when community measures fail, referring to a specialist can help significantly. Continual advances are being made with new agents and new surgical techniques being trialled in both the community and hospitals. **MT**

A list of references for this article is available on request.

## MILLARD - TREATING URINARY URGE INCONTINENCE

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### References

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1. US Department of Health and Human Services. Urinary incontinence in adults - clinical practice guideline. 1992; AHCPR publication No 92-0041. Rockville MD, 1992.
2. Millard RJ, Oldenburg BF. The symptomatic, urodynamic and psychodynamic results of bladder re-education programs. *J Urol* 1983; 130: 715-719.
3. Castleden CM, Duffin HM, Asher MJ, Yeomanson CW. Factors influencing outcome in elderly patients with urinary incontinence and detrusor instability. *Age Ageing* 1985 14; 303-307.
4. Millard RJ. Bladder control - a simple self-help guide (2nd ed). Sydney: McLennan & Petty 1995.
5. Appell RA. Clinical efficacy and safety of tolterodine in the treatment of overactive bladder: a pooled analysis. *Urology* 1997; 50(suppl 6A): 90-96.
6. Van Kerrebroeck P, Serment G, Dreher E. Clinical efficacy and safety of tolterodine compared to oxybutynin in patients with overactive bladder [abstract]. *Neurourol Urodyn* 1997; 16: 478-479.
7. Millard RJ, Tuttle J, Moore K, et al. Clinical safety and efficacy of tolterodine compared to placebo in detrusor overactivity. *J Urol* 1999; 161:1551-1555.
8. Madersbacher H, Stohrer M, Richter R, Burgdorfer H, Hachen HJ, Murtz G. Trospium chloride versus oxybutynin: a randomised double-blind, multicentre trial in the treatment of detrusor hyperreflexia. *Br J Urol* 1995; 75: 452-456.
9. Wehnert J, Sage S. Comparative investigations on the action of Mictonorm (propiverine hydrochloride) and Spasuret (flavoxate hydrochloride) on detrusor vesicae. *Z Urol Nephrol* 1989; 82: 259-263.
10. Rosario DJ, Leaker BR, Smith DJ, Chapple CR. A pilot study of the effects of multiple doses of the M3 muscarinic receptor antagonist darifenacin on ambulatory parameters of detrusor activity in patients with detrusor instability [abstract]. *Neurourol Urodyn* 1995; 14: 464-465.
11. Fowler CJ, Jewkes D, McDonald WI, Lynn B De Groat WC. Intravesical capsaicin for neurogenic bladder dysfunction. *Lancet* 1992; 339: 1239.
12. Lazzeri M, Beneforti P, Turini J. Urodynamic effects of intravesical resiniferatoxin in humans: preliminary results in stable and unstable detrusor. *J Urol* 1997; 158: 2093-2096.