

# Assessment and management of urinary incontinence

*There are few diseases to which a woman is liable, which have received so little notice at the hands of the ancients.....this one, so annoying, so destructive of happiness, and so urgent in its demands for relief, has received scarcely any attention – G Thomas, 1880*

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Urinary incontinence (UI) is an involuntary loss of urine that occurs when bladder pressure exceeds resistance to outflow. The International Continence Society defines it as 'urine loss, which is objectively demonstrable and is a social or hygienic problem'. It has all the characteristics of a typical 'geriatric syndrome' in that it is prevalent and costly, hidden, related to frailty, with multifactorial causation and a marked impact on quality of life (QoL).<sup>1</sup> The mechanisms of continence are not all understood, but the effects of UI on health (e.g. development of skin irritation, contribution to pressure ulcers, nocturia leading to insomnia, falls (20 - 30%), psychological wellbeing (embarrassment, frustration, social isolation, depression) and costs involved (currently exceeding \$20 billion per year in the USA) are well documented. A variety of effective treatments are known, but invariably underutilised.

## Epidemiology

Prevalence rates vary with age and symptoms:

Lifetime prevalence

- women: 14.5%
- men: 6.6%

Community-residing

- women > 60 years: 30%
- severe UI: 5 - 10%
- > 80 years: 35%
- severe UI: 18%

Community-residing men:

- > 60 years: 6%
- > 70 years: 18%
- > 80 years: 22%
- > 90 years: 34%

Old-age home residents: 50 - 80%

**Most elderly will not spontaneously communicate their UI and practitioners will have to specifically probe their patients to detect it.**

To establish true incidence and prevalence rates of UI is a major challenge: in most studies less than one-third of women who report UI have discussed this with their practitioner. As most studies rely on self-reporting, actual prevalence rates may be markedly higher. Reasons for underreporting are the opinion that UI is an unavoidable part of ageing (23%), embarrassment (38%) and feeling dirty with low self-esteem (38%). Most elderly will not spontaneously communicate their UI and practitioners will have to specifically probe their patients to detect it. Another reason for the wide range of prevalence is the fact that UI is not a single disease but rather a symptom of a number of different conditions, making consistent recording difficult.

Currently, UI is incorporated into a group of symptoms called lower urinary tract symptoms (LUTS), which are even more prevalent than, and as distressing as, UI *per se*. LUTS consist of storage, voiding and postmicturition symptoms. Storage symptoms include frequency, nocturia, urgency, urge UI (UUI), stress UI (SUI),

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mixed UI (MUI) and other UI. Voiding symptoms consist of intermittency, slow stream, straining and terminal dribble, and postmicturition symptoms are incomplete emptying and postmicturition dribble. In the (First-World) EPIC study, 64% of over 19 000 individuals reported at least one type of LUTS; storage symptoms occurred in 59% of women and 51% of men and the frequency of all kinds of LUTS increased with age. In this study, 12% of participants were over 70 years of age and their overall UI symptoms were 5 times higher than in the group under 39 years of age.<sup>2</sup>

Incorporated in LUTS is the entity of the overactive bladder (OAB), consisting of frequency and urge symptoms with or without UUI.<sup>3</sup> OAB is defined as an urgent need to void at least 4 times per week in the preceding month, with a history of at least 8 micturitions per day, and it affects 34 million adults in the USA alone.<sup>4</sup>

The prevalence of OAB is 16.9% in women and 16% in men, and 9.3% of these women have UUI: 55.5% of all women with OAB experience sudden large-volume accidents. Men with prostatic enlargement have OAB in 50 - 75% of cases. OAB is a distressing and disabling condition and often leads to non-therapeutic management techniques such as fluid restriction, non-adherence to diuretic medication and long-term use of wetness management products (costs: >\$130 million annually in the USA). Patients may be reluctant to leave home as unpredictable accidents cause social embarrassment, they become restricted in their mobility, socially isolated and develop a perception of ill health as well as ('unexplained') depression. In most studies less than half of the patients who sought medical help received active treatment.

OAB is associated with high indirect costs (over and above the direct costs of care): elderly with OAB have a twofold increased risk of injury from falls (an estimated 23% of the costs of caring for patients with OAB) and are at a much greater risk of recurrent

urinary tract infection (UTI) as detrusor instability causes incomplete bladder emptying.

### Physiology

Continence depends on intactness of the urinary system and the absence of mental or physical disability that impairs urination; 'social incontinence' is also determined by the distance to the toilet. In old age, the importance of adequate mentation, mobility, motivation and manual dexterity is usually not appreciated and individuals are labelled incontinent without proper investigation of these factors.

Age-related changes in the urinary tract that predispose to UI (but do not cause it) are listed in Table I.

Non-age-related predisposing factors (vaginal delivery is by far the most important) are listed in Table II. Patients over 75 years who have suffered a stroke have a significantly higher rate of UI than their younger counterparts ( $p = 0.031$ ). Note that hysterectomy is not associated with development of UI.

### Causes of urinary incontinence

One has to differentiate between acute and chronic causes.

**Table I. Age-related changes in structure and function of the urinary tract**

- Increased number of involuntary detrusor contractions with detrusor overactivity
- Increased post-void residual volume of 50 - 100 ml
- Increased nocturnal fluid excretion (nocturnal polyuria) due to low nocturnal ADH secretion, inappropriate nocturnal production of atrial natriuretic peptide
- Increased prostate volume in men, causing obstruction in 50%
- Decreased bladder capacity
- Decreased detrusor contractility
- Decreased ability of the detrusor to sustain tension during bladder emptying
- Decreased ability to postpone voiding
- Decreased urethral closing ability in women (postmenopausal oestrogen deficiency)

**Table II. Factors that predispose to chronic UI**

- Vaginal childbirth (neuromuscular damage)
- Pelvic organ prolapse
- Post transurethral resection of the prostate
- Obesity (increase in intra-abdominal pressure)
- Smoking (coughing increases intra-abdominal pressure)
- Cognitive decline
- Diabetes mellitus (independent risk factor)
- Cerebrovascular accident

### Acute urinary incontinence

Causes of acute UI are mostly reversible and can be remembered by the mnemonic DRIP (Table III). In all cases, a regular toileting diary should be kept, recording fluid intake, incontinence and toileting episodes.

A classic scenario for incontinence is an older patient with poor mobility in an unknown environment (e.g. hospital) who wakes up at night needing to void (poor vision, inadequate lighting) and cannot remember the way to the toilet. If nursing staff are not quick enough, an accident happens, the patient is labelled incontinent and an

**Table III. Reversible conditions associated with acute UI**

- D** Delirium
- R** Restricted mobility (pain, OA, RA, fractures, postoperative)  
Retention (drugs (anticholinergics), faecal impaction, immobility, bladder outflow obstruction)
- I** Infection  
Inflammation (atrophic urethritis and vaginitis)  
Impaction (faecal, occasionally with faecal incontinence)
- P** Polyuria (glucosuria, hypercalcaemia, caffeine, alcohol and nocturnal polyuria in cardiac failure, varicose veins)  
Pills (diuretics, psychotropics,  $\alpha$ -blockers, alcohol, Ca-channel blockers)

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inappropriate request for catheterisation follows, fully disregarding the external factors involved. There are generally only 3 indications for placing an indwelling catheter:

- when there is bladder outflow obstruction
- the patient's preference is hospice care
- there are stage IV pressure ulcers that cannot be kept dry (rare).

A condom catheter carries the same risks as an indwelling one and intermittent ('in-and-out') catheterisation is least harmful. This, however, requires intensive nursing care if the patient is not able to self-catheterise.

Urinary tract infections are among the most common infections in older women but need to be distinguished from asymptomatic bacteriuria (ASB). ASB is defined as the presence of bacteria in the urine (dipstick or culture), with or without pyuria, but in the absence of any symptoms. In community-dwelling women over 65 years of age, ASB has a prevalence rate of 17 - 33%; in nursing-home residents this is 55% for women and 15 - 40% for men. However, ASB cannot cause UI, or delirium, and morbidity/mortality rates are identical to individuals without ASB, so ASB should NOT be treated. To diagnose UTI, both nitrites and nitrates should be positive on urine dipstick. As UTI may cause UI it should be treated.

### Chronic urinary incontinence

The first classification of UI was drawn up by Goldberg in 1616 and our current classification is based on this proposal:

- urge UI (including OAB): voiding cannot be inhibited when the need to urinate

**UI is one of the two most frequent indications for institutionalisation, with a prevalence of 40 - 70%.**

is felt; associated with large-volume accidents

- stress UI: increases in intra-abdominal pressure (cough, sneeze) lead to loss of small volumes when sphincter function is compromised (after childbirth)
- mixed UI: combination of UUI and SUI
- overflow UI: neuropathic (diabetes mellitus) with autonomic neuropathy, causing post-void residual volume of > 200 ml; obstructive/dys-synergic detrusor contractions (large prostate)
- reflex UI: damage to spinal cord with loss of inhibitory reflexes (trauma, lumbar spinal stenosis, malignant processes)
- functional incontinence: patient cannot remember to toilet (dementia), has limited mobility (cannot reach toilet, undress in time).

### Associated co-morbidities

Additional problems in these patients are increased risk of falls (26%) and fractures (34%). Individuals with nocturia report disturbed sleep, lack of energy, chronic fatigue and poor health. Prevalence rates for depression are 60% in UUI, 44% in MUI-sufferers, 33% for those with obstruction and 14% in individuals with SUI. Sexual activity can be impaired by UI due to loss of libido, fear of leakage, depression and embarrassment (population estimates in the USA of sexually active older women are 56% for married and 5% for single women -1990 data). The contribution of UI to development of pressure ulcers in old-age home residents is well described.

### Treatment

Predisposing factors should be treated wherever possible, e.g. local vaginal application of oestrogen cream to counteract atrophic urethritis/vaginitis; no fluid intake 4 hours before bedtime or before leaving the house; constipation treated with mobilisation, fibre or sugars, e.g. sorbitol, lactulose, etc.; urine dipstick test and treatment of UTI if indicated; weight loss if BMI over 25; treating sinusitis and other causes of chronic cough (stop smoking); avoiding caffeine and alcohol (inhibition of arginine-vasopressin causes diuresis and increases bladder filling); preventing or decreasing build-up of pedal oedema during daytime (nocturnal polyuria) via mobilisation, leg elevation, support stockings and low-salt diet.

### Non-pharmacological treatment options

These include behavioural interventions (e.g. prompted/timed voiding, bladder training, Kegel exercises), absorbent pads

and catheterisation. In some cases of OAB, biofeedback and pelvic floor stimulation are very effective.<sup>5</sup>

*Prompted voiding:* carers ask residents on a regular basis if they need toileting assistance, the resident is assisted to the toilet on her/his request only and receives positive feedback when (s)he voids successfully when prompted. Nighttime sleep should never be disrupted.

*Timed voiding:* passive assisted toileting by caregiver at fixed 2 - 3-hour intervals.

*Bladder training:* development of individualised toileting regime that keeps voiding interval as long as possible without incontinence (labour intensive!).

### Pharmacological therapy

- UUI: anticholinergic drugs - oxybutin (side-effects include dry mouth, blurred vision, constipation and impaired cognition); tolterodine (same side-effects, but lower incidence). Male patients with outlet obstruction and OAB or UI need  $\alpha$ -blockers. In the nursing home, a combination of behavioural and pharmacological therapies gives best results in residents who consistently attempt to toilet but fail the programme.
- SUI: poor results with medication,  $\alpha$ -agonists (pseudoephedrine) do not have much effect, duloxetine is better. Kegel exercises/vaginal pessary are better, but surgery is best.
- MUI: treat the most bothersome component.
- Overflow incontinence: if it is neuropathic, use suprapubic pressure to empty the bladder or intermittent catheterisation, if obstructive, use  $\alpha$ -blockers, finasteride (men with large prostate) or surgery.
- Reflex incontinence: intermittent catheterisation
- Functional incontinence: frequent toileting, prompted voiding.

### UI in the old-age home setting

UI is one of the two most frequent indications for institutionalisation, with a prevalence of 40 - 70%. Differentiation between mobile and immobile patients and those with and without intact cognition is imperative. All care plans should address the environment (access), use of assistive devices and adaptive clothing as well as avoidance of physical barriers and restraints.

Cognitively impaired non-mobile residents need timed voiding and absorbent products. A trial of drugs can be given but side-effects may be prohibitive.

Cognitively impaired mobile residents need optimisation of their environment and a functional exercise programme (as far as their cognition will allow). A trial of drug treatment may be considered. If all else fails, absorbent products are indicated.

#### References

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### *In a nutshell*

- UI is highly prevalent but less than 30% of sufferers bring it to the attention of their medical practitioner.
- Age-related changes in the urinary tract predispose to UI but do NOT cause it.
- The importance of adequate mentation, mobility, motivation and manual dexterity in maintaining continence is grossly overlooked.
- Less than half of patients who do complain get any treatment.
- Causes of acute UI are combined in the mnemonic DRIP.
- ASB does NOT cause UI and should NOT be treated.
- Catheterisation should be avoided at all cost unless there is bladder outflow obstruction, the patient requests palliative care or there are stage IV pressure ulcers that cannot be kept dry.
- Effective treatment of both risk factors and incontinence *per se* does exist.

## *single suture* *Fertility failure*

Treatment that is designed to increase the chances of older women giving birth after fertility treatment may actually reduce their chances of having a baby, according to a recent paper in the *New England Journal of Medicine*. Pre-implantation genetic diagnosis (PGD) involves removing one or two cells from the early embryo and screening these cells for chromosome abnormalities that are associated with miscarriage. This technique is widely offered to women undergoing IVE, who are at risk of producing embryos with the wrong number of chromosomes.

Sebastian Mastenbroek and colleagues looked at 408 women aged between 35 and 41 who were undergoing IVF; 206 were given PGD. Twelve weeks after the embryos were implanted, 25% of the women who had PGD had become pregnant, compared with 37% of women whose embryos were selected using appearance – the standard method of embryo selection. Women in the PGD group also had a significantly lower live birth rate compared with those whose embryos were selected in the standard way.

Mastenbroek suggests that removing a cell may harm the embryo and lead to lower survival and the cell may also not carry a representative number of chromosomes. He suggests that women stick to traditional IVF treatment and save themselves the cost of PGD, given these results.

Mastenbroek S, *et al*. *NEJM* 2007; 357: 9.

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