Urinary incontinence in older people

Urinary incontinence is a common problem for older people. The multi-national EPIC study (Irwin et al, 2006) showed a rising prevalence of urinary incontinence with age; up to 20% in women over 60 years of age (*Figure 1*). Urinary urgency, urgency incontinence and nocturia are associated with significant adverse outcomes, including falls (Brown et al, 2000; Chiarelli et al, 2009) and some authors have suggested an association with an increased likelihood of admission to hospital or nursing home care (Thom et al, 1997), although this has not been replicated in later work (Holroyd-Leduc et al, 2004). It is well recognized that people suffering with incontinence will often not report this to anyone, through embarrassment and a belief that incontinence is a normal part of getting older (Dugan et al, 2001). This review provides an overview of the diagnosis and management of urinary incontinence in older people.

Urinary incontinence as defined by the International Continence Society is the complaint of any involuntary loss of urine (Abrams et al, 2002). This definition takes no account of frequency, duration, extent or impact and these factors need to be taken into account when assessing severity and burden of incontinence and other lower urinary tract symptoms. Maintaining continence, or achieving successful toileting, in old age relies on the integrated intact function of the brain, bladder and body. In older people there are many risk factors for urinary incontinence that are unrelated to the urinary tract: as such incontinence is rightly considered a geriatric giant.

Types and pathophysiology of incontinence

In general, the diagnostic entities which underlie urinary incontinence can be divided into urgency, stress, mixed, overflow and functional incontinence.

Urgency incontinence is characterized by urinary urgency. This is not merely a sensation of needing to void, but a sudden and compelling desire to void that is difficult to defer. The prevalence of urgency rises steadily with age. There are numerous theories for why this is, including myogenic and neurogenic changes to the pelvic floor, detrusor muscle of the bladder, and urothelium. Additionally, the influence of white matter lesions on changes in brain activation and the ability to suppress the sensation of urgency (Sakakibara et al, 2014), and the impact of reduced mobility on the time taken to reach the toilet may combine to make the maintenance of continence more difficult for older people. Overactive bladder, the clinical syndrome of urinary urgency, usually with frequency and nocturia, with or without incontinence and with no infection or other obvious pathology (Abrams et al, 2002) dominates the picture in later life.

Stress urinary incontinence is the leakage of urine on exertion, or on coughing or sneezing. It is rare in men, usually seen only after prostate surgery, particularly radical prostatectomy, but more common in women. Risk factors include parturition, obesity and a familial component.

Overflow incontinence occurs with chronic, painless retention of urine. It is seen most commonly in bladder outlet obstruction, for example from benign prostatic hypertrophy, or detrusor failure, an as yet poorly understood condition which leads to impaired bladder emptying. It is associated with axonal degeneration, muscle loss and fibrosis of the detrusor, and is often not associated with bladder outlet obstruction (Osman et al, 2014). Detrusor hyperactivity and impaired contractility is the term used in North America for the common occurrence of both entities. Functional incontinence refers to incontinence where the abnormality lies outside the lower urinary tract and may be the result of physical, cognitive or environmental factors; for example, a frail older person who needs caregivers to get to the toilet will eventually be incontinent if these are unavailable, even with a perfectly normal lower urinary tract.

Figure 1. Prevalence of urinary incontinence (UI) by age. From Irwin et al (2006).

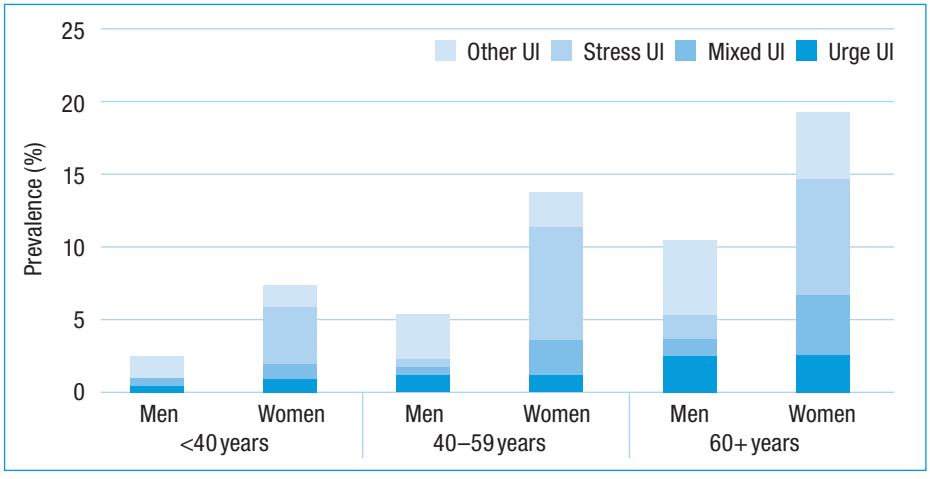

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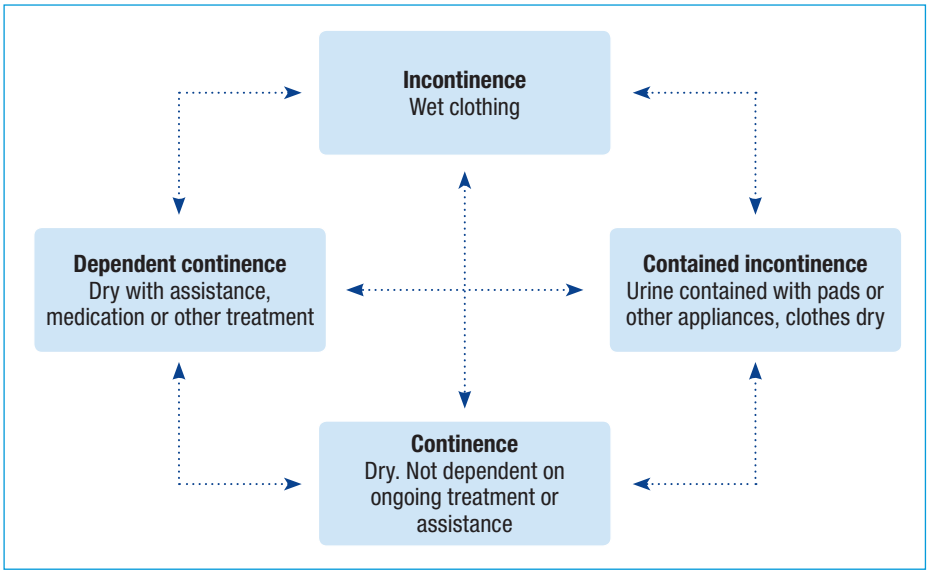
Figure 2. The continence paradigm. From DuBeau et al (2010).



Continence in frail older people should not be considered as a binary 'wet or dry' entity. Not everyone will achieve complete 'independent continence', the state of being dry without assistance. The 4th International Consultation on Incontinence (DuBeau et al, 2010) introduced a paradigm for continence (*Figure 2*), which describes continence as being independent, contained (with the use of pads or other devices), or dependent (on assistance, medication, or other treatment).

The impact of incontinence on quality of life is complex. The severity of urinary incontinence is more important than the type, although urgency urinary incontinence appears to have the most impact on quality of life (Barentsen et al, 2012) but restoration of complete continence is not a prerequisite for improvement.

Table 1. Other conditions which have an impact on continence status

Diabetes mellitus	Poor control can cause polyuria and precipitate or exacerbate incontinence; also associated with increased likelihood of urgency incontinence and diabetic neuropathic bladder	Better control of diabetes can reduce osmotic diuresis and associated polyuria, and improve incontinence
Degenerative joint disease	Can impair mobility and precipitate urgency urinary incontinence	Optimal pharmacological and non-pharmacological pain management can improve mobility and toileting ability
Chronic pulmonary disease	Associated cough can cause stress urinary incontinence	Cough suppression can reduce stress incontinence and cough-induced urgency urinary incontinence
Congestive heart failure Lower extremity venous insufficiency	Redistribution of oedema when lying flat increases night-time urine production which can contribute to nocturia and urinary incontinence	Optimizing pharmacological management of congestive heart failure, sodium restriction, support stockings, leg elevation, and a late afternoon dose of a rapid-acting diuretic may reduce nocturnal polyuria and associated nocturia and night-time urinary incontinence
Sleep apnoea	May increase night-time urine production by increasing production of atrial natriuretic peptide	Diagnosis and treatment of sleep apnoea, usually with continuous positive airway pressure devices, may improve the condition and reduce nocturnal polyuria and associated nocturia and urinary incontinence
Stroke	Can precipitate urgency and less often retention, also impairs mobility	Urinary incontinence after an acute stroke often resolves with rehabilitation; persistent urinary incontinence should be further evaluated Regular toileting assistance essential for those with persistent mobility impairment
Parkinson's disease	Associated with urgency urinary incontinence; also causes impaired mobility and cognition in late stages	Optimizing management may improve mobility and improve urinary incontinence. Regular toileting assistance is essential for those with mobility and cognitive impairment in late stage disease
Normal pressure hydrocephalus	Presents with urinary incontinence, along with gait and cognitive impairments	Patients presenting with all three symptoms should be considered for brain imaging to rule out this condition, as it may improve with a ventriculoperitoneal shunt
Dementia (Alzheimer's, multi-infarct, others)	Associated with urgency urinary incontinence; impaired cognition and apraxia interferes with toileting and hygiene	Regular toileting assistance essential for those with mobility and cognitive impairment in late stages
Depression	May impair motivation to be continent; may also be a consequence of incontinence	Optimizing pharmacological and non-pharmacological management of depression may improve urinary incontinence

Assessment of urinary incontinence

Some studies, such as the Norwegian EPINCONT study (Hannestad et al, 2000), found a prevalence of urinary incontinence of over 30% in people over 70 years of age, and it is well recognized that up to half of people will not report this problem to their doctors, or indeed anyone (Irwin et al, 2008). As such, active case finding is essential. It is important to identify and address treatable and reversible conditions that may cause or contribute to urinary incontinence, as outlined in *Table 1* (Wagg et al, 2015).

History

A systematic history of storage and voiding lower urinary tract symptoms should be taken. An enquiry about the ability to 'hold on' in the face of urgency is a good rule of thumb for determining severity. The clinician should also enquire about bowel function (urinary incontinence and faecal incontinence often co-exist, and the taboo around faecal incontinence is greater than urinary incontinence) and constipation, and other conditions that may contribute to an increased likelihood of unsuccessful toileting. Red flags which indicate more urgent action include pain on micturition and haematuria, likewise previous pelvic surgery or radiotherapy may indicate that a specialist assessment will be required. A good functional and social history is essential – find out how the patient gets to the toilet, and what help he/she needs to do so. Do not forget to ask about pad use – patients will improvise solutions, by using sanitary towels, toilet tissue, rubber gloves or other techniques to contain leakage.

> “Red flags which indicate more urgent action include pain on micturition and haematuria.”

Many commonly-used drugs are implicated in incontinence, and a thorough medication history should be obtained. These are summarized in *Table 2* from Wagg et al (2015). It is worth noting that although the associations are theoretically sound, evidence for the influence of many drugs is lacking. The reason for the medication review is twofold; first to reduce the exposure to those drugs with a predisposition to causing incontinence and second to reduce anticholinergic drug exposure if planning to add in a bladder antimuscarinic.

Examination

The minimum examination which should be performed by a general physician or geriatrician is an abdominal examination for a palpable bladder, examination of the external genitalia for abnormalities such as phimosis, hypospadias, urogenital atrophy and pelvic organ prolapse, which, if it extends

Table 2. Drugs which may predispose to urinary incontinence

Medications		Effects on continence
Alpha adrenergic agonists		Increase smooth muscle tone in urethra and prostatic capsule and may precipitate obstruction, urinary retention and related symptoms
Alpha adrenergic antagonists		Decrease smooth muscle tone in the urethra and may precipitate stress urinary incontinence in women
Angiotensin-converting enzyme inhibitors		Cause cough that can exacerbate urinary incontinence
Anticholinergics		May cause impaired emptying, urinary retention, and constipation that can contribute to urinary incontinence. May cause cognitive impairment and reduce effective toileting ability
Calcium-channel blockers		May cause impaired emptying, urinary retention, and constipation that can contribute to urinary incontinence May cause dependent oedema which can contribute to nocturnal polyuria
Cholinesterase inhibitors		Increase bladder contractility and may precipitate urgency urinary incontinence
Diuretics		Cause diuresis and precipitate urinary incontinence
Lithium		Polyuria caused by diabetes insipidus
Opioid analgesics		May cause urinary retention, constipation, confusion and immobility, all of which can contribute to urinary incontinence
Psychotropic drugs	Sedatives Hypnotics Antipsychotics Histamine1 receptor antagonists	May cause confusion and impaired mobility and precipitate urinary incontinence Anticholinergic effects Confusion
	Selective serotonin re-uptake inhibitors	Increase cholinergic transmission and may lead to urgency
Others	Gabapentin Glitazones Non-steroidal anti-inflammatory agents	Can cause oedema, which can lead to nocturnal polyuria and cause nocturia and night-time urinary incontinence

From Wagg et al (2015)

Please fill in this diary to the best of your ability. Your clinician will let you know if you need to measure the amount of urine you pass each time you visit the toilet, but in any case please mark when you go to the toilet using the scale on the left of the grid. Please could you also use the grading below to indicate your symptoms at that time?

Please rate the bladder sensation that you felt with each time you passed urine using the following scale.

1. **No feeling or urgency:** I could continue activities until I chose to use the toilet
2. **Mild feeling of urgency:** I could feel the need to urinate but it was easily tolerated. I could finish my activity or task before going to the toilet.
3. **Moderate feeling of urgency:** My urgency caused discomfort. I needed to stop my activity or task and go to the toilet.
4. **Severe feeling of urgency:** My urgency caused much discomfort. I had difficulty holding my urine: I had to stop my activity or task and hurry to the toilet to avoid a wetting accident.
5. **Unable to hold; leak urine:** I had a wetting accident before reaching the toilet.

Please tick the 'S' column if you leak urine accidentally with exertion, or are wet without realising it.

Table 3. Example bladder diary

	DAY ONE			DAY TWO			DAY THREE		
	Volume (or tick)	Urgency score	S	Volume (or tick)	Urgency score	S	Volume (or tick)	Urgency score	S
Midnight									
1 am									
2 am									
3 am									
4 am									
5 am									
6 am									
7 am									
8 am									
9 am									
10 am									
11 am									
Midday									
1 pm									
2 pm									
3 pm									
4 pm									
5 pm									
6 pm									
7 pm									
8 pm									
9 pm									
10 pm									
11 pm									

beyond the introitus on straining, warrants a discussion about referral to urogynaecology, a rectal examination to assess the size of the prostate and to exclude faecal loading and a dipstick urinalysis performed. In addition, if there are voiding symptoms, a post-void residual volume should be recorded and if the complaint is of stress urinary incontinence, a lying or standing cough test may reveal the diagnosis. In patients with evidence of neurological disease, a neurological examination is also required.

Possibly the most valuable part of the examination is the observation of the patient's ability to stand up, walk to the toilet, undress, void and then wash and dress afterwards, paying attention to the use of mobility aids and the cognitive ability to locate the toilet.

A bladder diary with fluid intake is a useful tool to quantify the frequency of urination, and the frequency and severity of urgency and incontinence episodes. An example is given in *Table 3*.

Management

The management of incontinence in frail older people should start with an assessment of the impact on their (and their caregivers') quality of life, and the setting of realistic and achievable expectations from treatment.

Lifestyle interventions

Several lifestyle interventions have been shown to be beneficial in both frail and robust elderly people, including exercise (both pelvic floor and general), weight reduction, and control of fluid intake to avoid over- and under-hydration. Some patients find reducing their caffeine intake beneficial for symptoms of urgency. Excess alcohol should be avoided as it acts as a diuretic.

There are three main models of continence care for frail older people:

Prompted voiding involves caregivers prompting people to use the toilet with positive reinforcement, and has been shown to reduce urinary incontinence episodes and increase self-initiated toileting in nursing home residents. This may be combined with musculoskeletal therapy aimed at improving gait speed and stamina.

Habit retraining identifies the individual's toileting pattern, through both bladder diary and regular wet checks, and a toileting schedule is designed to pre-empt episodes of urinary incontinence.

Timed voiding, also known as scheduled or fixed toileting, refers to a model of care whereby people are taken to the toilet by their caregivers at regular intervals, with no attempt to improve or normalize bladder function.

All require caregiver involvement and enthusiasm, and must take into account the cognitive and physical abilities of the individual patient.

In addition, simple steps should be taken to make toileting as easy as possible, including the provision of walking aids, well signposted toilets and, where needed, easy-access clothing with press studs or Velcro rather than fiddly buttons and zips. Constipation should be identified and treated, and culprit drugs stopped where possible.

Pelvic floor muscle training and surgery for stress urinary incontinence

Pelvic floor muscle training has been shown to be beneficial in even older women (Sherburn et al, 2011), but this relies on people having the correct technique and persisting with the exercises. Pelvic floor muscle training is recommended as the first-line treatment for stress urinary incontinence. If this fails, surgery may be considered. Since the introduction of the mid-urethral sling, a less invasive procedure, the more invasive surgeries such as colposuspension are now rarely performed. Mid-urethral slings are less effective in older than younger women, but have cure rates of up to 75%, and age alone should not be considered a barrier to surgery (Wagg et al, 2015).

Pharmacological treatment

Pharmacological treatment for urinary incontinence is dominated by that for overactive bladder which consists of either bladder antimuscarinics or mirabegron, a beta-3-adrenoreceptor agonist. All are effective in reducing urgency and urgency incontinence, but have variable side-effect profiles.

For the antimuscarinics, the most common and troublesome side effects are dry mouth and constipation. Of particular concern in older people is the potential for an adverse effect on cognition. Oxybutynin has been shown to impair cognition in even low doses, and this may go unnoticed by patients. The other antimuscarinics have been shown to have no impact on cognition, in the short term, in cognitively intact older people and solifenacin has been shown not to cause cognitive impairment in those with mild cognitive impairment (Wagg, 2012). Treatment should be started at the lowest dose for tolerability rather than efficacy; data from pooled analyses suggest that the oldest old (>75 years old) are more likely to need more, rather than less, medication to control their symptoms.

Mirabegron has similar efficacy to the bladder antimuscarinics and early data suggest tolerability and safety in community dwelling older people (Wagg et al, 2014). The pharmacological treatment of stress urinary incontinence is limited to the use of duloxetine, which is associated with nausea and is not currently recommended for use by national or international guidelines. Additionally, there are no data in older women which support its use. There has been some use for post-prostatectomy incontinence in men.

Other pharmacological measures for associated symptoms include the use of alpha-blockers and phosphodiesterase inhibitors for voiding symptoms in men, the use of topical oestrogens for vaginal symptoms in women and the use of desmopressin for nocturnal polyuria, all of which are outside the scope of this article.

TOP TIPS

- Actively seek incontinence in older people.
- A careful history and basic exam will make the diagnosis most of the time.
- Consider functional ability and aids to toileting.
- Catheters are a last resort.
- Look at the toilets on the wards where you work. Are they clean? Pleasant? Private? Well signposted and easy to find?

Incomplete emptying

The finding of urine in the bladder after micturition is not uncommon in older people; post void residual also rises with normal ageing. It is generally accepted that, if asymptomatic, a residual does not require treatment and can be safely left alone; some authors recommend action if the volume is >200 ml. Causes for the post void residual should be considered, including bladder outlet obstruction, neurological disorders,

KEY POINTS

- Urinary incontinence can be caused by storage symptoms, voiding symptoms or post-void symptoms.
- It is important to ask about the impact of urinary incontinence on quality of life, the patient's self-management strategy, and his/her physical and cognitive function.
- The examination should include the external genitalia and perineal skin, the presence of any prolapse, the prostate size and consistency (it is normally the same as the tip of the nose) and faecal loading.
- Ask; active case finding is essential.
- Lifestyle measures can be effective.
- Unlike oxybutynin, newer anticholinergics such as solifenacin and fesoterodine do not cause cognitive impairment, but have similar rates of side effects of dry mouth and constipation.
- Age is not a barrier to surgery for stress urinary incontinence.
- Intermittent self-catheterization is an option for impaired bladder emptying.
- Indwelling urinary catheters are an absolute last resort.

constipation and medication, and treated if present. In the absence of any underlying cause, and with higher or symptomatic post void residual, consider either intermittent self catheterization or intermittent catheterization by a caregiver or community nurse. A single pre-bedtime catheterization to empty the bladder in those people with impaired emptying and nocturia can be very effective, and age alone is not a barrier to learning how to self-catheterize. The use of bethanecol or alpha blockers for detrusor failure is not supported by the available evidence.

Indwelling catheters

Indwelling urinary catheters should only be used for incontinence when there is macerated skin or a poorly healing pressure ulcer, where changing of maintenance products is associated with considerable pain of discomfort or at the end of life. If being considered for long-term usage, a suprapubic, rather than indwelling urethral catheter is preferable for the avoidance of urethral complications; they are also easier to replace by community nursing staff, and have less impact on sexual function where relevant. For the appropriate patient, they can transform daily existence.

Functional incontinence

There has been little formal study of functional incontinence in the literature and hence little evidence to guide management. Practical measures to assist toileting (commodes, urinals, physical assistance, and adoption of toileting regimens) along with regular reinforcement of normal behaviours seem to result in some success. For incontinence associated with severe physical impairments, regular checking and changing of pads or the use of a condom catheter for men may be the only option.

Conclusions

Urinary incontinence and other lower urinary tract symptoms are highly prevalent in older people, and lead to significant distress, caregiver stress and morbidity. They are often amenable to treatment even in the oldest and frailest, but a combination of nihilism, embarrassment and lack of awareness of the potential for treatment leads older people, their caregivers and their doctors to ignore the issue. It is essential to ask as a matter of routine, as often a management plan that is not complex or costly will lead to large gains in quality of life. **BJHM**

Conflict of interest: Dr W Gibson has received speaker honoraria from Astellas and Pfizer; Professor A Wagg has received financial support from Astellas, Pfizer, SCA, and Watson Pharma for consulting, research, and speaker honoraria; Dr KF Hunter is co-investigator on studies funded by Astellas and SCA.

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