

## Urinary Incontinence in the Elderly

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Urinary incontinence (UI) is an involuntary loss of urine sufficient to be a social and/or health problem. The reported prevalence of this common condition is 15% - 30% in the older community-dwelling persons. In nursing home residents or the frail elderly it approaches 60-65%. It is a new epoch in the life of an elderly person: firstly, being one of the "weakest links" it throws open a wide differential diagnosis; secondly, the physician needs to differentiate transient from established or persistent incontinence; and thirdly, it may be a turning point in the personal and social life of an active elderly person and a burden to their caregivers.

The maintenance of continence in the lower urinary tract is by means of an integrated neurological control mechanism as well as factors like a sound mental state, mobility, dexterity and motivation. The genesis of UI is in the age – associated changes in bladder function: an increased frequency of uninhibited contractions as well as an abnormal relaxation pattern of the detrusor, impaired contractility and reduced bladder capacity. There is an increase in nocturnal urine production. Sex-specific changes are the increase in prostate size in male and urethral shortening as well as sphincter weakness in females (Figure 1 and 2).

A variety of medical situations may precipitate UI: a clouded sensorium in delirium; psychological problems like depression and psychosis; symptomatic urinary tract infection; restricted mobility; important, but often unrecognized stool impaction; atrophic urethritis and vaginitis in females; mobilization of edema fluid in treatment of congestive heart failure; drugs through multiple mechanisms like sedation, anti-cholinergic effects, urethral relaxation and diuresis.

In the above situations, UI is often acute and correction of the underlying disorder/ condition may lead to resolution. However, if this does not occur or incontinence occurs in a setting unrelated to an acute illness and persists then it is called persistent or established incontinence.

Established incontinence may be functional as in end-stage Alzheimer's disease or a result of intrinsic lower urinary tract abnormalities producing urge, stress or overflow incontinence. Combinations of the above may produce mixed incontinence.

- (i) **Urge incontinence:** It is seen in 25% of the elderly population and constitutes 40-70% of the cases of UI seen in the elderly. It is a component of an overactive bladder characterized by daytime frequency and nocturia. In addition, there is an urgent desire to void, a fear of leakage and inevitably, involuntary urine loss occurs. It is often associated with involuntary bladder contractions. Some have a poorly compliant bladder without involuntary contractions while others have a combination of detrusor hyperactivity and impaired contractility.
- (ii) **Overflow incontinence:** This condition is a result of bladder outflow obstruction, anatomic or neurogenic, a hypotonic or acontractile bladder or both mechanisms. It results in progressive distension of the bladder, increase in intravesical pressure and overcoming of the obstruction by the pressure generated. The patients have suprapubic distension, discomfort and persistent trickling of urine. In males, the most common cause is prostate enlargement while in females it is due to a pelvic mass or cystocele. Diabetes mellitus may also produce this presentation due to neuropathic bladder. Urethral stricture is also a common cause. Drugs like anticholinergics, calcium-channel blockers, beta-blockers and narcotics may all produce urinary retention with overflow.
- (iii) **Stress incontinence:** It is common in elderly women, seen in 25% of those presenting with UI. The leakage of small amounts of urine is associated specifically with maneuvers that raise intra-abdominal pressure like coughing, sneezing, laughing, exercising or in severe cases by changing posture from supine to standing position. It is caused by a disruption of the angle between the bladder neck and urethra due to weakened supporting tissues as a consequence of lack of estrogen, obesity, previous vaginal deliveries and/ or surgery. Although uncommon in men, it may occur after transurethral surgery, and/ or radiation

therapy for lower urinary tract malignancy when anatomic sphincters are damaged.

iv) **Functional incontinence:** It occurs when the involuntary urine loss occurs from an inability or unwillingness to reach a toilet on time. It is common in frail elders with dementia, Parkinson’s disease, delirium or other causes of altered mental state like narcotic or sedative drug usage. Inappropriate restraints, poor vision, depression, gait abnormalities and fear of falling may lead to this condition. The patients may also have abnormalities of lower urinary tract like detrusor hyperactivity.

v) **Mixed incontinence**

**Complications and Consequences of UI**

1. Episodes of UI are embarrassing leading to loss of self-confidence and poor self-esteem. 60% of UI elders develop depression.
2. As the symptoms are unpredictable, it often leads to social withdrawal, isolation with limitation of physical activity leading to frailty.
3. Fear of involuntary urine loss during sexual activity may lead to disruption of intimate relationships.
4. Productivity of elders as part of the workforce is

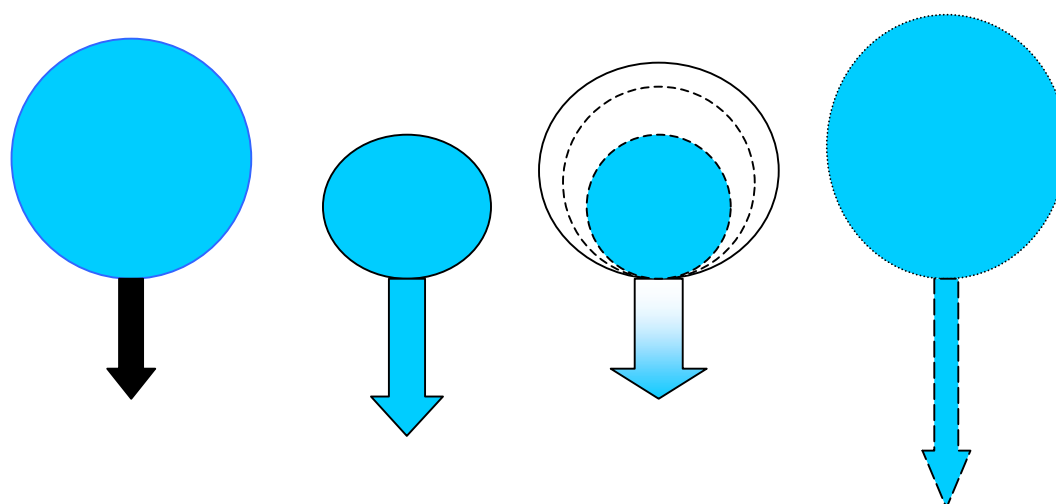
affected.

5. Caregivers are overburdened by the added load of coping with the incontinent elder.
6. It is a financial burden as protective garments and beddings are expensive.
7. UI often leads to institutionalization of elders.
8. Incontinence increases the incidence of falls and consequent fractures in elderly women.
9. UI is associated with increased mortality.

**Evaluation of UI**

It is, therefore, important to screen elders for UI. Questions about UI should be phrased in an easily understood and unambiguous manner. This should include asking about the loss of urine when one did not want to or the use of pads to prevent such accidents. Other questions include: volume of urine loss, frequency, strength of stream, body posture at the time or associated fecal incontinence.

Information should be sought on risk or predisposing factors e.g. diabetes mellitus, hypercalcemia, impaired cognition, functional disability, impaired sensory perception. Medication history is an essential part of evaluation.



Normal bladder		Aging bladder	
Bladder filling	Detrusor contraction	Increased Bladder excitability	Increased outlet obstruction
Detrusor relaxation	Sphincters relax	Reduced outflow resistance	Decreased contractility
Sphincters contracted	Smooth urine flow		Palpable bladder
Continent	Normal micturition in an appropriate environment	Urge incontinence Stress incontinence	Continuous dribbling

Figure 1. The normal and aging bladder

A more appropriate, less practical and expensive approach involves making toilets and toilet substitutes accessible, using disposable or washable highly absorbent bed pads and undergarments combined with some form of scheduled toileting. Restoration of continence can be attained by evaluating for and treating reversible causes of incontinence.

## 2. Established incontinence

The management is

- i) Non-pharmacologic
- ii) Pharmacologic
- iii) Invasive/ Definitive surgery
- iv) Appropriate referral for urodynamic studies, urologic or gynaecologic evaluation.

### A. Non-pharmacologic treatment

These are behavioral interventions which vary depending on the patient.

There are 2 types:-

- a) Patient dependent for mentally competent, functionally intact and motivated elders. The goal is to restore normal pattern of voiding and continence. They included rehabilitative exercises focusing on pelvic muscles (Kegel) which if correctly performed can be effective in urge, stress and mixed forms of incontinence. An element of biofeedback for these patients is useful but not readily available. Bladder training is also a useful modality in the above types of UI while bladder retraining is used after a period of temporary catheterization.
- b) Caregiver dependent for the dependant or cognitively impaired patient. It includes **prompted voiding** by the caregiver at scheduled 2 hour intervals during the day; **habit training** based on patients voiding patterns and **scheduled toileting** for those with severe cognitive impairment who cannot respond to communication. The former two are useful in functional UI.

The above methods need to be complemented by environmental assessment, its modification, use of adaptive equipment and assistive devices.

### B. Pharmacologic treatment

The most common use of drugs is for treatment

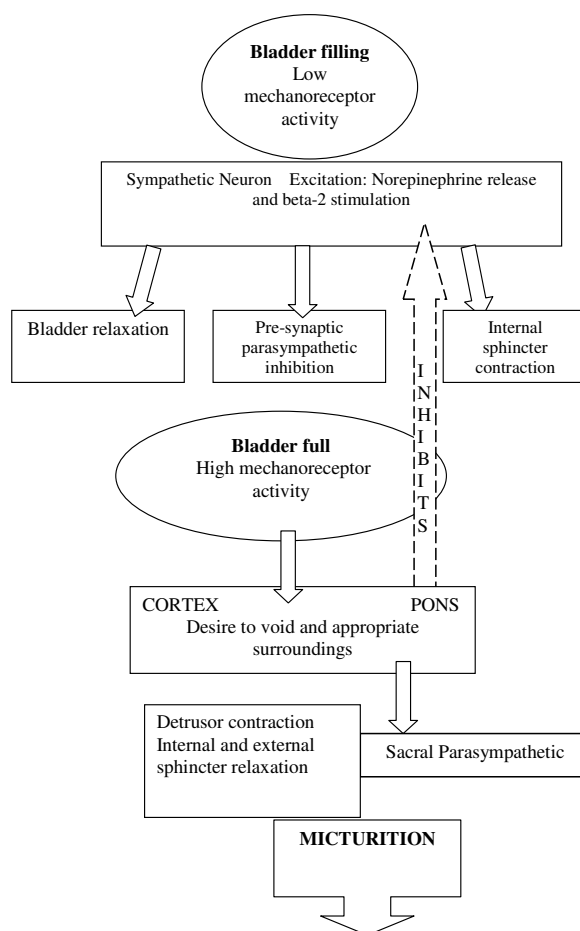


Figure 2. The mechanism of normal continence and micturition

A short voiding diary (48-72 hours) is a reliable and valid way to classify UI.

The examination should include a complete neurological, abdominal, urogenital, pelvic and rectal examination. The urethral response to cough is useful to evaluate stress UI. The anal and bulbocavernosus reflexes should not be missed. Non invasive bladder ultrasound evaluation for residual urine is helpful in overflow UI. The post voiding bladder residual volume > 50 ml suggests inadequate bladder emptying.

### Management of Urinary Incontinence

The management and goals depend on the categorization of incontinence.

#### 1. Acute Incontinence

Indwelling catheters are commonly used in acute care settings for this condition. While they are beneficial in accurate measurement of urine output, they pose risks of infection and may prolong immobilization.

of overactive bladder. The contraction of the detrusor muscle depends on the muscarinic receptors of the bladder. The anti-muscarinic drugs produce a variety of side-effects that are detrimental in the elderly: delirium, cognitive impairment, orthostatic hypotension, falls and cardiac arrhythmias. Selective agents are better. Of the muscarinic receptors, M3 mediate direct detrusor muscle contraction while M2 inhibit bladder relaxation and modulation of bladder contraction in pathologic conditions.

Oxybutynin is a relatively non-selective agent acting on M1, M2 M3 receptors. The dose is 2.5 – 5.0 mg thrice daily; extended release and transdermal forms are available.

Tolterodine is more selective acting on M2, M3 receptors. The extended release form is more efficacious, the dose being 2-4 mg once a day.

M3 selective agents like darifenacin and solifenacin are effective in overactive bladder but are not yet in the mainstream of the geriatric practice.

Trospium which is a hydrophilic amine is another approved agent with low CNS side-effects but data regarding usefulness in frail elders is limited.

In cases with stress incontinence, imipramine hydrochloride is a useful drug as it increases bladder capacity and bladder outlet resistance but side-effects in the elderly may produce more harm than benefit. Similarly, alpha-receptor agonists e.g. pseudoephedrine are useful but should be prescribed with caution. Vaginal estrogen creams and low-dose conjugated estrogens may be used in females. The decision to use estrogens alone or in a cyclic manner with progestational agents must be made after weighing the risks of breast cancer and cardiovascular disease.

In situations involving overflow incontinence, especially in males with prostatic symptoms, alpha-blockers like prazosin, terazosin and doxazosin may be used.

### C. Invasive procedures and surgery for UI

Overflow incontinence due to prostatic hypertrophy responds to prostatectomy.

Several surgical procedures are available for stress incontinence.

- Proline suburethral sling insertion
- Tension free vaginal tape surgery

There are many complications that may occur in these surgical procedures. Therefore, patient selection and surgical experience is the key to success.

If the patient is unable to tolerate surgery then the options are:

- Periurethral sphincter collagen injections
- Vaginal pessaries
- Sacral neuromodulation

In refractory situations of detrusor overactivity, clean intermittent catheterization may be useful. In detrusor underactivity, double voiding, suprapubic pressure and intermittent or indwelling catheterization is sometimes the only option.

### D. Appropriate referral

Patients are usually managed by the geriatric specialist but may need referral for further urology, gynecologic or urodynamic evaluation. The situations where referral is appropriate are:

- Surgery or irradiation of the pelvis or lower urinary tract in the last 6 months.
- 3 or more symptomatic UTI episodes in a year.
- Gross enlargement of prostate on digital rectal examination, prominent indurations or asymmetry of lobes.
- Marked pelvic prolapse.
- Post-void residual volume > 50 ml or > 1/3 of pre void urine.
- Difficulty in passing a 14-French straight catheter.
- Hematuria: > 5 RBC per high power field on microscopy in the absence of infection.
- Failure to respond to behavioral or drug therapy.

### References

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