

# Urinary Incontinence in the Elderly

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**Probably 20% of community dwelling older adults have enough incontinence to limit some aspect of their lives. Affected individuals go to great lengths to deny and hide urinary incontinence, which can pose physical and psychosocial impediments to the enjoyment of life. There are differing pathophysiologies of incontinence and what helps one type may not help and may in fact worsen another. Problems of incontinence can be associated with major neurological damage or can be functional or iatrogenic. This article reviews the more commonly presenting forms of urinary incontinence (acute, chronic, urge, overflow, and stress incontinence) including treatment options and the role of the incontinence specialist.**

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After the age of 3, the involuntary loss of urine is socially stigmatizing, whether it occurs in grade school, at the office, during a bridge luncheon, on the golf course, or in the nursing home. Children and adults go to great lengths to deny and hide urinary incontinence, which can pose physical and psychosocial impediments to the enjoyment of life (1).

Probably 20% of community dwelling older adults have enough incontinence to limit some aspect of their lives. This can lead to diminished social assuredness and activity, depression, not taking medications such as diuretics prescribed for important reasons (e.g. congestive heart failure), and financial expense for the various forms of incontinence wear ranging from thin pads to padded underwear to frank adult diapers. It is also likely that the race to the bathroom for frail but independent elderly people leads to falls that might not otherwise have occurred.

More women are incontinent than men, but both sexes feel the changes of aging neurologic and urologic systems. Women have additional changes related to anatomy and previous childbirth, and men from prostatic enlargement or prostate surgery. However, incontinence is not an invariable part of aging and, in most cases, can be treated in whole or in part with significant improvement in hygiene, health, and confidence.

There are differing pathophysiologies of incontinence, and what helps one type may not help and may in fact worsen another. Hence, it is not wise to prescribe a medication for incontinence in the primary care setting without a focused evaluation.

Problems of incontinence can be associated with major neurological damage (multiple sclerosis, severe spinal cord injury, severe stroke, normal pressure hydrocephalus, advanced dementia) or can be "functional" or "iatrogenic." The latter refer to people

who have mobility or communication limitations due to strokes, amputations, restraints, sedatives, or casts but otherwise have the ability to recognize the need for and control micturition. This article reviews the more commonly presenting forms of urinary incontinence.

## Physiology of Micturition

The brain has a lot to do with control of micturition, as anyone knows who feels the urge heighten upon approaching his or her own home bathroom, or hears the sound of running water! The frontal lobe and pons are involved in micturition, and pressure on these areas may be the cause of urinary incontinence seen in normal pressure hydrocephalus, a sometimes correctible cause of incontinence in elderly people characterized by the triad of gait abnormality, urinary incontinence, and cognitive impairment.

The spinal cord and the somatic and autonomic peripheral nerves connect the brain and the urinary system itself. The dome of the bladder, or detrusor muscle, contracts under cholinergic/muscarinic stimulation, and the outlet portion of the bladder, including the urethra, contracts primarily with alpha-adrenergic stimulation (Figure 1). Thus, the bladder is largely under control of the autonomic nervous system. The pelvic muscles (which form a sling where the dome and outlet meet) and the external urethral sphincter are both somatically innervated and help to retain urine. There is more voluntary control of these portions of the micturition system.

Normally the bladder fills at very low pressure until the volume reaches about 400 cc (a little less in the elderly) when the rising pressure leads to a gradually increasing feeling of fullness. The

pressure rise triggers a reflex arc resulting in 1) increased cholinergic stimulation and contraction of the detrusor and 2) diminished adrenergic stimulation of the outlet (with resulting relaxation), resulting in expulsion of urine. The muscles of the pelvic floor and external urinary sphincter can voluntarily contract and limit the flow of urine for a time.

## Acute Incontinence

Acute incontinence is usually caused by infection or medication. For instance, in a man with benign prostatic hypertrophy who takes an over-the-counter sinus medication for a cold, the decongestant component will further tighten the outlet, and the antihistamine component will render the detrusor less contractile. The net result may be urinary retention and overflow incontinence.

## Chronic Incontinence

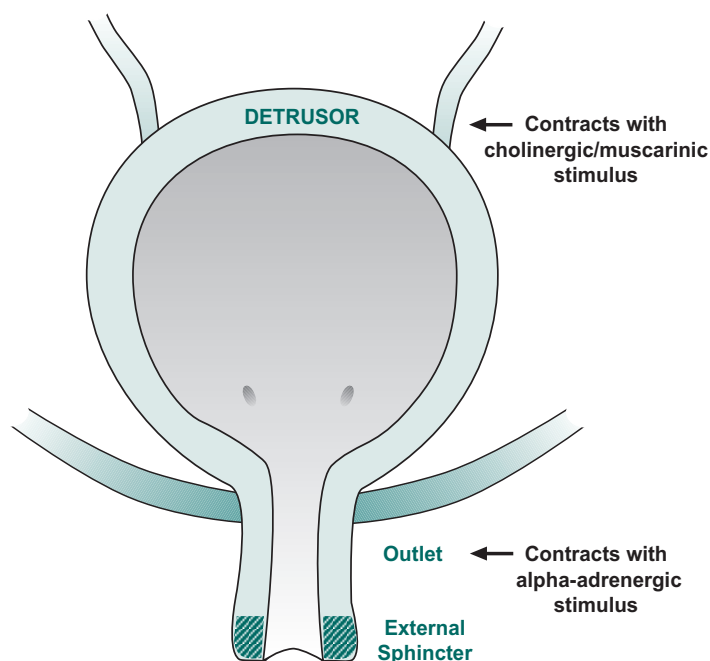
### *Detrusor Malfunction*

In chronic incontinence, the detrusor muscle can malfunction in two ways: it can contract prematurely (before the rising pressure causes an awareness of fullness) or it can fail to contract, allowing the bladder to enlarge, sometimes massively, until the pressure of the urine in the bladder overcomes the opposing pressure of the outlet structures. Urine will leak out, usually unsensed, until the bladder volume diminishes to the point that the bladder pressure is less than that of the outlet, at which point urination will cease, although the bladder may still be very full. These types of incontinence are called 1) urge incontinence – the need to urinate is felt nearly simultaneously with the release of urine, and 2) retention/overflow incontinence – the leakage of an overfilled bladder, not until the bladder is empty but only until the pressure in the bladder is less than that of the outlet.

It is important to perform at least a screening evaluation before prescribing a medicine for incontinence. While anticholinergic medicines might help the bladder fill to a larger capacity in the case of urgency and thereby diminish the number of incontinence episodes, the same medication in overflow incontinence would have the deleterious effect of furthering urinary retention. This can lead to infection and high pressure transmitted to the kidneys resulting in impairment of renal function. Common causes of urinary incontinence are listed in Figure 2.

### *Detrusor Hyperactivity: Urge incontinence*

Urinary urge incontinence (detrusor hyperactivity, spastic bladder) is the most common type of incontinence in late middle to older age. The neurological precursors are not well elucidated, but urgency can be worsened by bladder irritation from cystitis, atrophic tissue due to hormone depletion, or bladder tumors or stones. This occurs with prostatic hypertrophy as well.

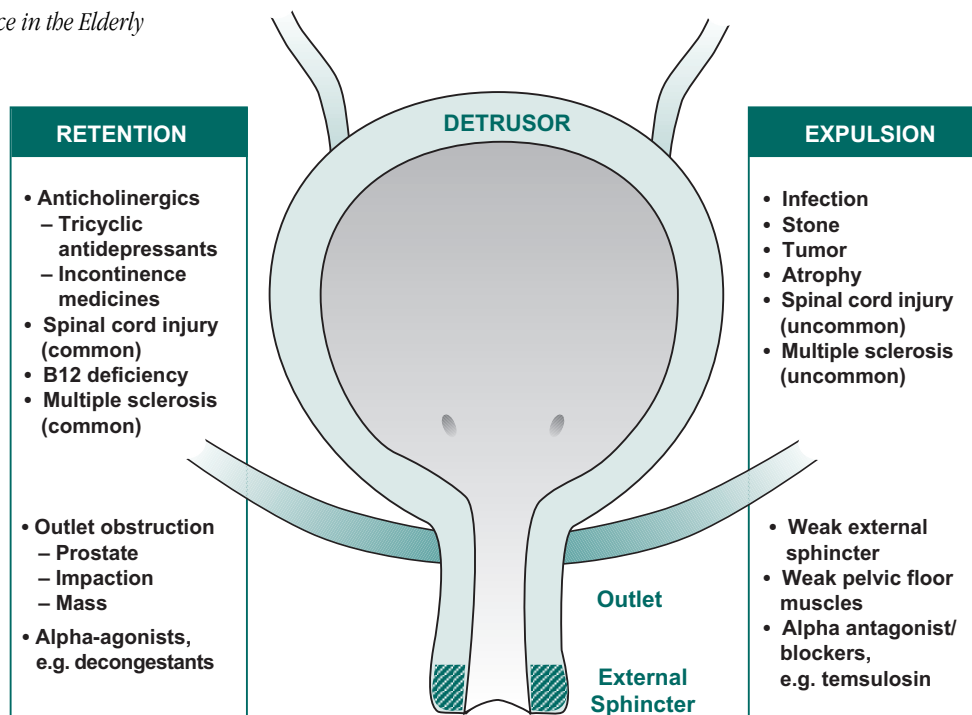


**Figure 1.** Basic urinary physiology.

The history is straightforward: the urge to urinate is felt suddenly instead of gradually, and only briefly before release of urine. With this history, the examination should focus on excluding any major visual or palpable abnormality, and by urinalysis to exclude infection or evidence of tumors or stones (hematuria). An immediate post-void residual volume, by an in-and-out catheterized urine volume measurement (or by ultrasound when available), helps exclude urinary retention if treatment with an anticholinergic medication is being considered. In older individuals, a residual volume of 75-100 cc is acceptable.

If vaginal atrophy is present in a woman with urgency, it can be assumed that urethral and bladder atrophy are present as well, and, if not contraindicated, topical or systemic estrogens may be prescribed. After about 3 months, this may have the effect of improving the urgency to the degree that incontinence is decreased or cured. At the same time, anticholinergic medication may be prescribed, if not contraindicated by preexisting confusion/dementia or by uncontrolled narrow angle glaucoma. These medications result in a larger bladder capacity and longer time intervals before the urge is felt but do not necessarily remove the urgency. Patients should also be encouraged to time the intervals between urgent episodes and to voluntarily void at regular time intervals before urgency occurs.

Common anticholinergic medications for urinary urgency include antihistamines, tricyclic antidepressants, and pharmaceuticals designed specifically for urge incontinence: oxybutynin and tolterodine, both now available in longer acting preparations. There is no convincing evidence of an advantage to either long-acting oxybutynin or tolterodine in controlling incontinence or in avoiding side effects such as dry mouth, constipation, or confusion.



**Figure 2.** Common causes of urinary retention and involuntary expulsion.

Burgio et al compared medication and behavioral treatments for urge and mixed incontinence with each other and placebo (2). Behavioral treatment decreased incontinent episodes by 80.7%, drug treatment by 68.5%, and placebo by 39.4%. The “placebo” patients completed diaries, attended 4 clinic visits, and had therapeutic attention from a nurse-practitioner who inquired about progress and adverse effects. Urge incontinence was significantly controlled in most women after four outpatient sessions for education and biofeedback. While not applicable to everyone with urinary urgency, and not reimbursed by Medicare, this approach has shown significant efficacy with virtually no side effects or complications and was effective in people with some dementia as well.

### ***Detrusor Hypocontractility: Overflow Incontinence***

For overflow incontinence, once again the history is suggestive: small to moderate amounts of urine “leak” out frequently without warning. This occurs when the pressure in the overdistended bladder is able to overcome the pressure of the outlet structures and stops far short of emptying the bladder. This can occur because the detrusor is hypocontractile e.g. diabetic autonomic neuropathy, or because the outlet pressure is high, as with prostatism, fecal impaction, or other pelvic mass. For men, outlet obstruction is more common; for women, detrusor weakness, frequently of uncertain cause, is more likely. In either case, however, overflow incontinence, suggested by the history and confirmed by a large post-void residual volume, is best served by referral and urodynamic testing. In addition to the incontinence, infection and kidney failure are frequent consequences of obstruction.

Treatment is restricted to intermittent or, occasionally, chronic bladder catheterization to empty the bladder. Alpha-blockers such as tamsulosin can reduce the outlet pressure modestly, reducing the volume and pressure in the bladder but not eliminating involuntary urine loss. Cholinergic medications are rarely effective and have many side effects.

It is sometimes not possible to distinguish detrusor underactivity from bladder outlet obstruction (Figure 2). Obstruction to outflow can be caused by fecal impaction, pelvic mass, prostatic hypertrophy, or cancer. If there is no mass or impaction, it is sometimes hard to tell if overflow incontinence is primarily neurological (such as occurs with autonomic neuropathy) without urodynamic testing because detrusor weakness and outlet obstruction cannot be reliably distinguished clinically. Consultation with an incontinence specialist is recommended for patients with symptoms of overflow incontinence and large post-void residual volume. Urodynamic testing is helpful in elucidating how much of the retention is due to mechanical and how much to neurological etiology.

### **Outlet Malfunction**

#### ***Outlet Hypocontractility: Stress Incontinence***

Urinary stress incontinence can result from weakness or malposition of the somatically innervated pelvic floor muscles, or more commonly, laxity of the urethral musculature, especially of the external sphincter. Damage to the structures or to their innervations, which can occur with childbirth or prostate and other surgery, result in a leakage of urine whenever intra-abdominal pressure is elevated,

such as when coughing, laughing, exercising, or bending over. The history is suggestive, and incontinence can be demonstrated by observing leaking after asking the person to strain, especially in the standing position.

Treatment includes exercises to strengthen the voluntary muscles of the pelvic floor, injection of collagen around the urethral sphincter to increase the outlet pressure, suspension of the bladder/sling apparatus surgically, and keeping a low bladder volume by frequent voluntary voiding. Prosthetic sphincters are sometimes implanted with good results. Pelvic floor exercises must be done correctly, and biofeedback is one effective method of training. The most frequent mistake by the learner is to contract the buttocks rather than the levator muscles.

### **Mixed Incontinence**

Can a person have more than one reason for incontinence? “Mixed” incontinence is most commonly due to “urge” plus “stress” in women, and to “urge” plus “overflow” in men with benign prostatic hypertrophy.

## **So How Does the Primary Care Physician Approach Urinary Incontinence? (Table)**

Most importantly, make the diagnosis:

1. Ask your patient if he/she has a problem with involuntary urine loss.
2. Observe his/her clothing for pads or odor.
3. Think of incontinence in the depressed/withdrawn patient or one who has begun to fall more often.

If incontinence is present, try to distinguish the three main histories:

1. Detrusor hyperactivity/urge: the need to void and urinary leakage are nearly simultaneous.
2. Overflow: unsensed leakage of small to moderate amounts frequently.
3. Stress: leakage with laughing, coughing, bending, etc.

Examine for stress leakage, pelvic mass, perineal sensation, cystocele, enlarged or irregular prostate, fecal impaction, and urogenital atrophy. Examine the urine for evidence of bleeding or infection. If bleeding does not resolve with treatment of infection and atrophy, urologic referral is indicated to exclude tumors or stones.

Measure the immediate post-void residual volume by in-and-out catheterization or ultrasound; 75-100 cc is acceptable. The results should establish the need for primary care treatment or referral depending on specific diagnosis and practice capabilities.

**Table. Diagnosis and treatment of urinary incontinence.**

### **HISTORY – Emphasis Points**

- Is urinary incontinence present?
- Recent medication changes or additions, including over the counter
- Characteristics of episodes
- Voiding diary (3)



### **EXAMINATION – Emphasis Points**

- Brief Neurologic Exam – stroke, MS, normal pressure, hydrocephalus
- Pelvic/rectal exam
  - Atrophy
  - Cystocele
  - Prostatic hypertrophy or mass
  - Sphincter laxity (anal or urethral)
  - Leakage when straining
  - Enlarged bladder



### **TESTS – for infection, cancer, retention**

- Urinalysis for occult blood, pyuria
- Immediate post-void residual volume– should be less than 100 cc



### **MEDICATIONS\***

- Urge Incontinence\*\*
  - Imipramine 10 mg bid
  - Oxybutinin, **extended release** (Ditropan XL) 5 mg daily or bid
  - Tolterodine, (Detrol) 1 or 2 mg bid (lower if taking medications which activate the P450 enzyme system)
  - Vaginal estrogen – 1/2 gm 3 to 5 times weekly, if not contraindicated
- Stress incontinence
  - Alpha adrenergic stimulators such as Phenylephrine
- Overflow incontinence due to benign prostatic hypertrophy
  - Tamsulosin (Flomax)\*\*\* 0.4 mg daily, 30 min a.c.

\* Please see appropriate references for side effects, contraindications and approved usage.

\*\* All of these except estrogen can cause obstipation, urinary retention, confusion and dry mouth, especially in the elderly.

\*\*\* Not approved for use in women or for urinary retention due to hypoactive detrusor, but has been used in this situation with modest improvement.

For urge incontinence, infection and atrophy should be treated, and, if not contraindicated, anticholinergic medication *plus* prompted voiding should be initiated.

For overflow incontinence: consultation. A trial of an alpha-adrenergic blocker such as tamsulosin may help somewhat if not contraindicated.

For stress incontinence, pelvic floor exercises should be taught and patients should be advised to begin voluntary contraction prior to the stress. Prescribe prompted voiding to maintain a low urine volume. Alpha agonist medications such as over the counter decongestants will increase outlet pressure. If not completely effective, refer to an incontinence specialist.

### **What Does the Incontinence Specialist Do?**

An incontinence specialist will reconfirm the history, examination, urinalysis, and treatment decision, as well as perform urodynamic studies. Although these studies do not actually simulate natural bladder filling precisely, they help to elucidate pathophysiology and to sort out the contribution of obstruction and neurological abnormality, which would point to entirely different treatments.

A specialist will also recommend medications or dosage changes and work closely with incontinence therapists in administering biofeedback and other techniques. Surgical treatments are available for prostatism, cystocele, prolapse, or tumors. Implantation of a prosthetic urethral sphincter, the injection of collagen or other materials to strengthen the urethra, and the implantation of sacral nerve stimulation devices may be recommended in appropriately chosen patients.

### **Conclusion**

The primary care physician skilled at the medical history, examination, and office-based procedures can improve the quality of life of incontinent older adults, though referral to a specialist is recommended for complex cases. Identifying incontinence is the most important step. Many interventions are available for this common geriatric problem, but getting the patient to discuss the problem is the first priority.

### **References**

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