URINARY INCONTINENCE
IN THE OLDER MAN

Theodore M. Johnson II, MD, MPH,
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This article provides an overview of urinary incontinence (UI) in
the older man. The focus is on factors resulting in gender differences in
UI and on the diagnostic approach and treatments for older men. The
impact of the prostate gland on UI is highlighted; greater detail on the
prostate in the aging man can be found elsewhere in this issue.

LOWER URINARY TRACT CHANGES ASSOCIATED
WITH AGING

UI, the involuntary loss of urine that represents a hygienic or social
problem to the individual, is not an inevitable consequence of aging.
Depending on the setting, time frame, and definition used, the preva-
ence of UI in older adults is 30% to 50%. Usual estimates of the
prevalence of UI in community-dwelling men and women older than 65
years of age are 15% to 30%. Despite the fact that incontinence is
treatable, only about one third of older adults present to physicians for
management assistance. Predictably, those with more severe inconti-
nence are more likely to seek help; those with better access to health
care also are more likely to seek help for UI.

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Ouslander).

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Medicine; the Wesley Woods Center of Emory University (IGO); and Atlanta Veterans
Affairs Medical Center, Decatur, Georgia

MEDICAL CLINICS OF NORTH AMERICA
Several age-related changes of the genitourinary system may, in part, explain the rising prevalence of UI with advancing age. With older age, bladder capacity decreases, maximal urinary flow rate decreases, and postvoid residual increases. Although these factors account for some of the higher prevalence of UI in older adults, they are not the only relevant factors. A detailed urodynamic classification of all the lower urinary system properties (bladder compliance during filling, presence or absence of detrusor contractions, presence or absence of bladder outlet obstruction, and functional urethral length) does not predict continence. Integrated and proper functioning of many body systems is involved in maintaining continence, and incontinence does frequently accompany physical frailty. In the same manner in which balance is not a leg problem, continence is not simply a pelvic problem. Lower and upper extremity impairment, decreased vision and hearing, and anxiety or depression are factors that predict higher rates of falls and dependence in activities of daily living; they are also risk factors for incontinence. In older adults, UI is strongly, positively associated with an increased risk of dying, and it has nothing to do with slipping and falling on a wet floor. Nearly all of the increased mortality with UI is due to physical frailty and medical illness that accompany or cause UI.

**MALE VERSUS FEMALE INCONTINENCE**

Significant differences in the epidemiology, anatomy, and pathophysiology of UI between men and women are summarized in Table 1.

**Epidemiologic Differences**

UI prevalence is lower for older men (7% to 15%) than for older women (15% to 30%). In men, but not in women, the prevalence of detrusor instability increases with age. Only one quarter of men with UI find it a negligible problem. Of all the lower urinary tract symptoms potentially caused by benign prostatic hyperplasia (BPH), UI is rated as the most bothersome, along with urgency and nocturia. The psychosocial impact of UI seems greater for those with severe incontinence and for younger as opposed to older men. Management strategies in dealing with UI differ between men and women. Men are more likely to limit fluids and trips and more likely to see a physician about their incontinence (T. M. Johnson, unpublished data from the National Survey on Self Care and Aging). Women more frequently wear pads and perform exercises for incontinence (T. M. Johnson, unpublished data). For unexplained reasons, the association between UI and increased mortality is stronger in men than in women, even after adjusting for illness and functioning.
Table 1. DIFFERENCES BETWEEN OLDER MEN AND WOMEN WITH URINARY INCONTINENCE

<table>
<thead>
<tr>
<th>Factor</th>
<th>Older Men</th>
<th>Older Women</th>
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<tbody>
<tr>
<td>Epidemiology</td>
<td>Overall 7%-15%</td>
<td>Overall 15%-30%</td>
</tr>
<tr>
<td>Prevalence</td>
<td>More likely to limit fluids and trips; perhaps more likely to have seen a physician</td>
<td>More likely to wear pads and perform exercises</td>
</tr>
<tr>
<td>Care strategies</td>
<td>Lithostratic growth lengthens the urethra and displaces the bladder neck superiorly</td>
<td>Childbirth injury and aging may result in descent of bladder neck and denervation</td>
</tr>
<tr>
<td>UT and risk factors</td>
<td>Likely greater association between UT and mortality in men than women</td>
<td>Hypoestrogenemia and childbirth</td>
</tr>
<tr>
<td>Anatomy</td>
<td>Prostatic growth lengthens the urethra and displaces the bladder neck superiorly</td>
<td>External striated urethral sphincter separates in the posterior midline to accommodate the vagina</td>
</tr>
<tr>
<td>Prostate/pelvic floor</td>
<td>Urinary stricture is closed circumferentially from bladder to bulbular urethra and is connected to the bulbocavernous muscle</td>
<td>Prostate size in men is positively associated with increasing age. Prostatic growth lengthens the urethra and displaces the bladder neck superiorly. The position of the prostate augments the activity of the external urethral sphincter by supporting the bladder in a favorable position. Men do not have bladder and urethral hypermobility resulting in stress incontinence, as women do. Radical prostatectomy renders the urethra-vesicular junction geometry less favorable for maintaining continence and places greater demands on the function of the external urethral sphincter for maintaining continence.</td>
</tr>
<tr>
<td>Pathophysiology</td>
<td>Frequent cause of UT; due to bladder outlet obstruction from prostate or urethral stricture, acontractile or neurogenic bladder</td>
<td>Frequent cause of UT; due to local genitourinary conditions, CNS disorders, and idiopathic</td>
</tr>
<tr>
<td>Overflow UI</td>
<td>Urge UI</td>
<td>Frequent cause of UT; due to either poor anatomic support or urethral dysfunction</td>
</tr>
<tr>
<td></td>
<td>Stress UI</td>
<td></td>
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</tbody>
</table>

UI = Urinary incontinence; CNS = central nervous system.

Anatomic Differences

Prostate

Prostate size in men is positively associated with increasing age. Prostatic growth lengthens the urethra and displaces the bladder neck superiorly. The position of the prostate augments the activity of the external urethral sphincter by supporting the bladder in a favorable position. Men do not have bladder and urethral hypermobility resulting in stress incontinence, as women do. Radical prostatectomy renders the urethra-vesicular junction geometry less favorable for maintaining continence and places greater demands on the function of the external urethral sphincter for maintaining continence.
Urethra and Urethral Musculature

The total length of the urethra is much longer in men (>25 cm) than in women (4 cm), yet only a small portion of the urethral length in men functions as a urinary sphincter. The term \textit{functional urethral length} describes the length of urethra that physiologically operates as a sphincter. The functional urethral length in men is only slightly longer than it is in women. The external striated urethral sphincter is closed circumferentially during the course of the urethra from the bladder to the bulbar urethra and connected to the bulbocavernous muscle in men. In women, the external striated urethral sphincter separates in the posterior midline to accommodate the vagina and is not circumferential throughout the course of the urethra (Figs. 1 and 2).

Pathophysiology

In general, gender differences in anatomy result in different pathophysiology of UI. In women, stress UI (hypermobility and intrinsic sphincter deficiency) and urge incontinence (detrusor hyperactivity) predominate. In men, overflow incontinence and urge incontinence predominate. Women rarely present with overflow incontinence, unless some

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{Figure1}
\caption{Relationship of the muscles of the urogenital diaphragm to the bladder and urethra (after Brodie). The muscles of the urogenital diaphragm ascend from the vaginal introitus to the proximal part of the urethra, encircling the urethra and vagina to varying degrees, depending on the level of transverse section. At the level of the proximal part of the urethra, they form a circumferential urethral sphincter. The subpubic fascial condensations of the endopelvic fascia cover the proximal urethra binding the anterior portions firmly to the pubis. (From Mostwin JL, Burnett AL: Anatomic aspects of urinary incontinence. In O'Donnell PD (ed): Urinary Incontinence. St. Louis, Mosby, 1997; with permission.)}
\end{figure}
neurologic deficit is present (spinal cord disruption or diabetic neuropathy). Men do not have stress incontinence without a previous history of pelvic or prostate surgery. Overflow incontinence and urge incontinence may coexist.

**Overflow Incontinence**

Overflow incontinence in men can be due to anatomic blockage of the bladder outlet (owing to BPH, prostate cancer, or urethral stricture) or because of the inability of the detrusor to generate adequate pressure. Overflow incontinence can also be precipitated by the use of α-agonists or anticholinergic medications in men with subclinical bladder outlet obstruction. It is difficult on the basis of history to distinguish between overflow and urge incontinence. Men with overflow incontinence may have dribbling or urgency symptoms and may strain while urinating resulting in small voided volumes. Symptom inventories to detect BPH show poor correlation with objectively proven obstruction. One commonly used scale, the American Urological Association 7 (AUA-7) score, contains symptom complexes of obstruction (hesitancy, starting-and-
stopping stream, incomplete emptying, and poor force of stream) and irritation (urgency, frequency, and nocturia). These symptoms are non-specific for BPH and obstruction, considering that many older women have similar lower urinary tract symptoms.

**Urge Incontinence (Detrusor Instability)**

Urge incontinence in men can be due to local recognized factors (such as lower genitourinary tract infections, fecal impaction, pelvic irradiation), can be idiopathic (detrusor instability), or can be due to early obstruction. Urge incontinence results from inappropriate bladder contractions that overcome bladder outlet resistance and generally result in near-complete emptying of the bladder. Patients with detrusor instability usually present with frequent urination, nocturia, and accidents with large-volume urine loss (>100 ml.). The volume of urine lost with accidents varies tremendously and does not seem dependent on bladder volume. The history of urge incontinence is neither sensitive nor specific for the objective demonstration of detrusor instability during urodynamic studies, especially considering that bladder outlet obstruction may be responsible for symptoms. An irresistible urge to void in those with urge incontinence is a common complaint, but up to 20% with proven detrusor instability do not have this symptom.

**Stress Incontinence: Sphincter Damage**

Stress incontinence in women can be due to a hypermobile urethra, sphincter insufficiency, or reduced support by the pelvic floor musculature in the bladder outlet. In men, stress incontinence occurs less often and only in men with sphincter or nerve trauma during prostatectomy. The removal of the prostate during radical prostatectomy eliminates the support given to the bladder neck by the prostate and exposes the external urethral sphincter to the full task of maintaining continence. Patients with stress incontinence are likely to complain of losing small amounts of urine with coughing, straining, lifting, or changing posture. This history is highly sensitive, yet only moderately specific because factors, such as coughing and changing position, could also precipitate involuntary bladder contractions.

**CLINICAL APPROACH TO THE OLDER MAN WITH URINARY INCONTINENCE**

**Diagnostic Strategy**

The basic components of the diagnostic evaluation of an older man with UI are described subsequently and summarized in Table 2.
Table 2. BASIC COMPONENTS OF THE DIAGNOSTIC EVALUATION OF THE OLDER MAN WITH URINARY INCONTINENCE

<table>
<thead>
<tr>
<th>Component</th>
<th>History</th>
<th>Estimation of postvoid residual urine</th>
<th>Uniflowmetry</th>
<th>Pressure flow studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical examination</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Urinalysis</td>
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</table>

*May be a helpful, noninvasive screening test.

**Necessary to diagnose obstruction in patients with suggestive symptoms, low flow rate, or elevated postvoid residual.

**History and Physical Examination**

Key aspects of the history and physical examination of the older man with UI are listed in Table 3. Medical history should be gathered about conditions related to continence, including prostate cancer and pelvic surgery, diabetes, glaucoma, hypertension, depression, diabetes mellitus, congestive heart failure, and previous treatment of UI. Patients should be asked about prescription and over-the-counter medications with particular attention to α-agonists and antagonists, anticholinergic medications, calcium-channel blockers, sedative-hypnotics, diuretics, and narcotics, which have specific effects on the lower urinary tract system. Questions should be asked about alcohol, caffeine, and overall fluid intake.

The evaluation should continue with a careful history directed at understanding the nature, severity, and burden of the incontinence. Patients should specifically be asked about their goals in receiving treatment because different therapies offer varying success and risks and require different levels of participation. Patients should be asked early about previous care seeking for help with incontinence, past treatments received, and their results. The focus should be on urinary symptoms, noting onset and duration of incontinence, frequency, amount of urine lost per episode, and any contributing factors. For men with a history of prostate surgery, a history of leakage occurring immediately after coughing, laughing, or posture change has good positive predictive value in diagnosing stress incontinence. Men with near-continual leakage after prostate surgery are likely to be helped only by surgical intervention, and this history should be sought. Classic symptoms of urge incontinence, such as urine loss with hand washing, hearing running water, or while rushing to the bathroom, are insensitive and nonspecific. Dysuria and frequency may indicate infection.

Special attention should be paid to neurologic signs and symptoms, including central nervous system trauma, difficulty walking, low back injury or surgery, memory loss, Parkinson's disease, stroke, and neuropathy. Figure 3 illustrates the influence of neurologic conditions on lower urinary tract function based on the location of the lesion. Men with incontinence are unlikely to have neurologic disease as the cause of UI, but the converse is not true. In several of the neurologic diseases mentioned, UI frequently presents as an early symptom.
Table 3. KEY ASPECTS OF HISTORY, PHYSICAL EXAMINATION, AND TESTING IN THE OLDER MAN WITH URINARY INCONTINENCE

<table>
<thead>
<tr>
<th>History</th>
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<tbody>
<tr>
<td>Review of active medical conditions</td>
</tr>
<tr>
<td>History of pelvic or prostate surgery</td>
</tr>
<tr>
<td>Review of medication for causes of polyuria or impaired bladder contractility</td>
</tr>
<tr>
<td>Diuretics, anticholinergics, α-agonists, psychotropics, alcohol</td>
</tr>
<tr>
<td>Fluid intake pattern</td>
</tr>
<tr>
<td>Symptoms of incontinence</td>
</tr>
<tr>
<td>Onset</td>
</tr>
<tr>
<td>Amount of urine lost</td>
</tr>
<tr>
<td>Associated factors at time of urine loss</td>
</tr>
<tr>
<td>Other lower urinary tract symptoms</td>
</tr>
<tr>
<td>Irritative: frequency, urgency, nocturia</td>
</tr>
<tr>
<td>Obstructive: intermittent stream, weak stream, incomplete emptying, hesitancy</td>
</tr>
<tr>
<td>Other: kidney infections, stones, hematuria</td>
</tr>
<tr>
<td>Other symptoms</td>
</tr>
<tr>
<td>Neurologic: lower extremity weakness, spasticity, reflex changes, psychological; bowel</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal and genital examination</td>
</tr>
<tr>
<td>Rectal examination</td>
</tr>
<tr>
<td>Fecal impaction, prostate enlargement and abnormalities</td>
</tr>
<tr>
<td>Mobility</td>
</tr>
<tr>
<td>Cognition</td>
</tr>
<tr>
<td>Neurologic (for patients with signs or symptoms)</td>
</tr>
<tr>
<td>Sensory function: (anal sphincter, S2-4)</td>
</tr>
<tr>
<td>Motor function—dorsiflexion (tibialis anterior, L4-S1), plantar flexion (gastrocnemius, L5-S2), and toe extension (S3-4)</td>
</tr>
<tr>
<td>Reflex integrity—bulbocavernosus (S2-4), anal reflex (S2-5), quadriceps (L3-4), and Achilles (L3-5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiding diary</td>
</tr>
<tr>
<td>Cough test</td>
</tr>
<tr>
<td>Urinalysis</td>
</tr>
<tr>
<td>Postvoid residual</td>
</tr>
<tr>
<td>Uroflowmetry</td>
</tr>
<tr>
<td>Referral for further evaluation</td>
</tr>
<tr>
<td>History of recent genitourinary procedure, prostate enlargement or mass, urinary retention, suspected obstruction, hematuria</td>
</tr>
</tbody>
</table>

Patients should be asked about bowel movements and constipation. Although most clinicians are likely to think of urinary function vertically (kidneys, ureters, bladder, sphincters), it is important to recognize that the bladder has an important horizontal neighbor in the crowded pelvis, the rectum (N. Galloway, personal communication). Distention of the distal colon with stool affects the function of the bladder. Treatment of severe constipation is likely to reduce UI.

The physical examination of patients with UI should focus on the abdominal, urogenital, and central and peripheral nervous system examinations. The abdomen should be examined for suprapubic tenderness, lower abdominal masses, or bladder distention. The finding of a palpable
Figure 3. The central nervous system, the spinal cord, and the peripheral nervous system control of bladder function. Conditions listed can affect continence by impact on level of nervous system indicated by brackets. (From Kennedy MJ, Rudy DC: Incontinence caused by neurologic disease. In O'Donnell PD (ed): Urinary incontinence. St. Louis, Mosby, 1997; with permission.)
bladder suggests outlet obstruction or an atonic bladder, yet the bladder may not be palpable even when the patient has significant postvoid residual urine volume. The external genitalia should be examined for sensation; abnormalities in the foreskin, glans, and perineal skin; and cremasteric reflex. The rectal examination may reveal fecal impaction, decreased perirectal sensation, absent anal wink, or an enlarged prostate gland. The size of the prostate does not correlate well with the presence of obstruction. The patient’s resting sphincter tone should be assessed; then the patient should be asked to perform a voluntary sphincter contraction. Abnormal clinical signs, such as sacral anesthesia or reduced anal sphincter tone, can suggest potentially serious and emergent lumbo-sacral pathology.

Because physical impairments have an impact on continence and the treatment of CI, the patient should be observed rising from a chair and walking. Identifying cognitive impairment in an older patient in whom surgery, medication, or behavioral treatment is contemplated is important. The clinician can use a screening test, such as the draw a clock test, in the evaluation of older patients to identify previously unrecognized cognitive impairment. A low score on such a screening examination suggests cognitive impairment, which may be associated with detrusor instability or indifference to the symptoms, or both.

Voiding Record

Having patients keep a frequency-voiding record gives important information, and the recording of this information by the patient can itself be an important intervention. On occasion, patients may recognize by the pattern of accidents the cause. For some patients, each time they fail to go to the bathroom after 3 hours since the last void, they leak. In one case, a retired man had accidents 2 hours after his two martinis at lunch. Such a chart or diary also documents each episode of incontinence, which can be used later to measure effectiveness of the intervention. Voided volumes give an approximation of bladder capacity, and small volumes (125 mL) may suggest urge incontinence. A pattern of frequent voids (more than one an hour) and small volumes without evidence of obstruction could point to a patient who would be helped by bladder relaxant therapy.

Cough Test

For those with a past history of pelvic surgery, asking the patient to cough forcefully, while standing if possible, is a provocative test for stress incontinence. The patient should note if the bladder felt full (would normally go to the bathroom), incompletely full (would normally not go to the bathroom but could try), or empty. Whether or not there was leakage and if it was coincident with the coughing should be noted. The patient can then be asked to void, the voided volume measured, and the postvoid residual determined (see later).
Urinalysis

A screening dipstick can detect glucosuria, blood, and evidence of infection. Repeated sterile cultures with hematuria should prompt an evaluation for bladder carcinoma or other urinary tract pathology.

Estimation of Postvoid Residual

The postvoid residual volume should be measured in all incontinent men. This measurement can be done by inserting a catheter into the bladder in sterile fashion or with the use of a bladder ultrasound scan 5 minutes after the patient has voided. Use of urethral catheterization in men with prostate obstruction may cause a urinary tract infection. Portable ultrasound has been shown to be highly reliable, especially at low and high bladder volumes, and after the initial high investment ($8000 to $12,000 in 1998), this measurement is obtained cheaply and noninvasively. Although the definition of high residual urine volume is controversial, 200 mL or more indicates pathologic obstruction or poor bladder contractility and merits further urologic or urodynamic evaluation. A postvoid residual volume of 50 mL or less is considered normal bladder emptying. The absence of an elevated postvoid residual volume does not indicate that the patient is not obstructed. An obstructed patient can empty the bladder by straining. An elevated postvoid residual volume in bladder outlet obstruction is an end-stage sign of obstruction.

Uroflowmetry

In contrast to women, uroflowmetry is a useful screening test in older men. Figure 4 illustrates the relationship between peak flow and:

![Graph showing Normal Peak Uroflow Rate versus Age in Normal Subjects](image)

*Figure 4. Normal peak uroflow rate versus age in normal subjects (with bladder volume >150 mL). (From Drach GW, Ignatoff J, Layton T: Peak urinary flow rate: Observations in female subjects and comparison to male subjects. J Urol 122:215, 1979; with permission.)*
age by gender. The patient should be observed voiding, and, if available, a flow curve should be performed. Figure 5 shows different characteristics of an idealized flow curve. A voided volume of greater than 150 mL is usually needed to record an accurate peak flow rate. The minimal acceptable peak flow rate for a man declines with rising age, and for men age 65 and older, 9 mL/s is considered to be the minimal acceptable peak flow rate. Decrease in the flow rate can be partially attributed to a decline in the voided volume that occurs in older patients. A low peak flow rate is suggestive of obstruction and can be associated with a higher chance of developing obstruction in the future. Although low values are likely to indicate bladder outlet obstruction, there are other possibilities. There is some overlap in the findings of obstructed and nonobstructed men on uroflowmetry. One third of men with peak urinary flow rates greater than 15 mL/s are obstructed, and 10% to 25% of those with flow rates of less than 10 mL/s are not obstructed. Low urine flow rates can also result from a hypoactive, poorly contractile detrusor muscle.

![Diagram](image)

**Figure 5.** Uroflow parameters. A. Total voiding time, the period during which measurable flow occurs. B. Time to peak flow rate, the interval between the onset of voiding and the moment of peak flow. C. Mean flow rate, calculated by dividing total voided volume by total voiding time. D. Peak flow rate, the maximum flow rate achieved during a representative voiding event. (From Wahl GR: The urinary flow rate. In O'Donnell PD (ed): Urinary Incontinence. St Louis, Mosby, 1997; with permission.)
Pressure Flow Studies

After the basic evaluation, treatment for the presumed type of UI should be initiated unless there is an indication for further evaluation. Further evaluation is indicated for a history of previous surgery or radiation therapy, frequent urinary tract infections, severe hesitancy, postvoid residual greater than 200 mL, inability to pass a catheter, persistent hematuria, or failure of initial treatment. Further investigation could involve common urodynamic tests, such as voiding cystourethrogram, multichannel cystometry, pressure flow study, and sphincter electromyography. Multichannel cystometry is safe in older patients and probably underused. It is the definitive manner in which to diagnose bladder outlet obstruction. A urologist or gynecologist generally performs these tests.

Treatment Options

Treatment modalities for older men with UI are summarized in Table 4.

Table 4. TREATMENT MODALITIES FOR OLDER MEN WITH URINARY INCONTINENCE

<table>
<thead>
<tr>
<th>Pathophysiology</th>
<th>Treatment Modalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overflow incontinence</td>
<td>Primary treatment is via relief of obstruction. Transurethral resection of the prostate is a mainstay of treatment, although α-blockers and finasteride have a role in treatment. In cases of medication-induced urinary retention, discontinuation may be sufficient. Some patients may require a period of intermittent catheterization.</td>
</tr>
<tr>
<td>Urge incontinence</td>
<td>If patient has coexisting bladder outlet obstruction, may be improved through relief of obstruction. Anticholinergic medications, such as oxybutynin and tolterodine, combined with bladder training techniques are appropriate first-line therapies. For postprostatectomy urge incontinence, patients benefit from biofeedback treatment.</td>
</tr>
<tr>
<td>Stress incontinence (postprostatectomy)</td>
<td>Patients benefit from biofeedback treatment except those with total incontinence, characterized by continual leakage in the absence of stress (coughing, laughing) maneuvers. Total incontinence is initially managed with collagen injections, which, if not successful, may be followed by implantation of an artificial sphincter.</td>
</tr>
<tr>
<td>Functional incontinence</td>
<td>In nursing home setting, evidence to date suggests that men and women benefit equally from caregiver-dependent behavioral interventions, such as prompted voiding. External and chronic indwelling catheters should be avoided if possible.</td>
</tr>
</tbody>
</table>


Overflow Incontinence

For men with moderate-to-severe obstruction resulting from prostate enlargement, surgery is the treatment of choice. Terazosin (Hytrin), an α-adrenergic antagonist (dosage titrated up as tolerated to 10 mg nightly) is effective in minimizing symptoms related to prostatism, and possibly finasteride (Proscar, 5 mg by mouth nightly) has a role, but neither terazosin nor finasteride should be the treatment of choice when there is urinary retention. Transurethral prostatectomy can result in a high cure rate for patients with properly functioning bladders. Transurethral resection of the prostate can also cause UI. Men with moderate BPH assigned randomly to transurethral resection of the prostate or watchful waiting had equivalent occurrence of persistent UI at 3 years of follow-up. In these patients, full evaluation, including urodynamic testing before surgery, is essential to rule out coexisting causes of incontinence. Overflow incontinence resulting from a poorly contractile bladder is generally poorly responsive to behavioral or pharmacologic therapy. Surgery is not indicated for men with poorly contractile bladders, and in most cases, these patients are required to perform clean intermittent catheterization.

Urge Incontinence (Detrusor Instability)

The treatment of detrusor instability involves decreasing or blocking uninhibited bladder contractions, increasing bladder capacity, and prolonging the time from symptoms of urgency to voiding. Behavioral and pharmacologic therapies are the mainstays of treatment. Behavioral techniques include bladder training (or retraining), habit training, and pelvic muscle exercises with and without biofeedback. Bladder training involves an educational program, scheduled voiding, and positive reinforcement to train the patient to resist sensations of urgency, to postpone voiding, and to urinate on a fixed timetable. Pharmacologic therapy has proven useful for many patients with detrusor instability. Anticholinergic agents are first-line drug therapy in these patients, and oxybutynin is the agent of choice. The dosage of oxybutynin demonstrated to be effective in clinical trials is 2.5 to 5.0 mg three times a day, although some elderly patients benefit at a much lower dosage. Other drugs observed to be of benefit in clinical trials include dicyclomine hydrochloride; propantheline; and tricyclic antidepressants such as imipramine, doxepin, desipramine, and nortriptyline. Tolterodine, an anticholinergic agent that may have more bladder selectivity than other agents, has also become available. In dosages (dosage range: 1–2 mg twice daily) of 2 mg twice a day (usual dose), it is nearly as effective as oxybutynin but appears to cause less severe dry mouth.

Bladder outlet obstruction may be the underlying mechanism in some men with urge incontinence. Prostate surgery in men with bladder outlet obstruction is effective at eliminating nearly all urge incontinence. Evening fluid restriction and nighttime toileting are potentially helpful in selected patients, with and without cognitive impairment, who have urge incontinence. In extreme, intractable urge incontinence,
surgical urinary diversion with urostomy or continent diversion could be performed as a last resort.17

Postprostatectomy Incontinence: Sphincter Insufficiency and Detrusor Hyperactivity

Postprostatectomy incontinence can be due to detrusor dysfunction or urethral insufficiency caused by sphincteric injury, bladder dysfunction, or bladder outlet obstruction.25 Different patient series demonstrate different predominant mechanisms for postprostatectomy incontinence (stress or urge incontinence) depending on the indication for surgery (cancer or BPH) and the surgical approach employed (transurethral resection, suprapubic prostatectomy).27 The approach to postprostatectomy depends on the mechanism accounting for the incontinence. For many patients with either stress or urge postprostatectomy incontinence, treatment with pelvic muscle exercises is appropriate. Kegel exercises can reduce symptoms of urgency and prevent urge incontinence through feedback inhibition from the pelvic floor to the detrusor muscle.16 These techniques have been studied with and without biofeedback in women but only with biofeedback in men.11 Studies in women have shown that it is not intuitive how to perform a Kegel exercise properly. Only 50% of women who received a single verbal instruction performed a pelvic muscle contraction properly, and many tightened abdominal muscles in a manner expected to worsen the incontinence.4 Bladder-sphincter biofeedback techniques record bladder, rectal sphincter, and abdominal pressures or electromyographic activity. This information is displayed visually for the patient, who learns to relax the bladder and abdominal muscles and contract pelvic floor muscles based on input from the changes in displayed pressures or electrical activity. These procedures require the presence of a trained and enthusiastic therapist. Patients with high postvoid residuals, cognitive impairment, and continual leakage are poor candidates for biofeedback.

When conservative therapy has failed, surgery may be appropriate. Men are candidates for periurethral bulking injections (Fig. 6), although these techniques are better studied in women than in men.17 In combining results of 346 men in 10 studies, the mean cure rate was 20% (range, 0 to 66%), and the mean cure or improvement rate was 42% (range, 0 to 81%).17 Periurethral injections are believed to help by improving urethral coaptation, periurethral bulking, and compression. The results of injections seem to be better for posttransurethral or open prostatectomy rather than radical prostatectomy.17 Periurethral injections seem less useful for severe postprostatectomy incontinence.4 Multiple injections may be necessary, and concomitant detrusor instability may negatively affect success.1

Artificial sphincter implantation allows patients with severe or continual urinary leakage to gain continence (Fig. 7). In combining 10 studies and a total of 346 men, the mean cure rate of artificial sphincter implantation is 66% (range, 33% to 88%) and the cure or improved rate is 85% (range, 75% to 94%).17 The patient manipulates a device, which has been surgically implanted in the scrotal sac, to deactivate a pressure
cuff around the urethra allowing urine to flow out. The pressure cuff automatically reinflates a minute after voiding. In cases in which the patient becomes incapacitated and can no longer manipulate the device, the urologist can deactivate the device (leaving cuff deflated) without reoperation. The use of the device is controversial in the setting of...
postradiation therapy or cryotherapy and in patients with urethroplasty after pelvic fracture.

**Interventions in the Nursing Home Facility**

UI in nursing home patients is highly associated with increasing mental and physical disability. Diagnostic evaluation of men in this setting is as described previously, with several caveats. In frail incontinent men, a sterile preparation of the glans and shaft of the penis followed by application of a clean condom catheter allows for collection of a urine sample with good agreement with in-and-out catheterization results. The treatment of asymptomatic bacteriuria in men with chronic, stable UI is unlikely to reduce incontinence.

Several caregiver-dependent behavioral interventions in the nursing home setting have been shown to be effective in managing UI. Timed voiding requires that the patient void according to a timetable. This technique asks the patient to void according to the schedule of the staff,
and attempts to toilet the resident may be associated with many dry runs. Prompted voiding is a technique requiring a caregiver to check for wetness at routine intervals and to prompt the patient to void. This prompted voiding is an effective adjunct to habit training in dependent and cognitively impaired nursing home or home care patients, provided that they can recognize some degree of bladder fullness or the need to void or can ask for assistance and respond when prompted to toilet. Patients who respond well to prompted voiding can be identified during a 3-day trial of the intervention.37

**Devices**

Different devices are available for the management of UI. In general, these are nonspecific, palliative treatments that may be appropriate for certain patients who are unable to be treated or evaluated. Disposable diapers seem to be less expensive than reusable diapers, when laundry costs are included in the calculation.34 Chronic indwelling catheters are associated with a high rate of complications, especially urinary tract infections,37 and should be used in situations in which there is bladder outlet obstruction that has failed other management techniques. There is no evidence to support giving suppressive antibiotics in the setting of a chronic, indwelling catheter. Generally speaking, there is agreement that an indwelling catheter should be changed once a month or every other month, but data supporting this practice are few. The U.S. Food and Drug Administration has approved new catheters embedded with antibiotics that may resist bacterial adherence and colonization, but the role of these devices is yet to be determined. Condom catheters provide another alternative to management but are not free of side effects. Abrasions, dermatitis, penile ischemia or necrosis, and maceration have all been described,37 but the frequency of these complications is unknown. Use of a condom catheter brings an increased risk of urinary tract infection, with 24-hour-a-day users having a higher frequency of infection than nonusers and with nighttime-only users having an intermediate risk of infection.33

**SUMMARY**

Older men experience UI less often than older women, but the disruption and bother they experience because of UI is significant. Several anatomic differences between men and women account for different pathophysiology of incontinence. In men, overflow incontinence and detrusor instability predominate; stress incontinence is seen only in cases in which men have had prostate surgery. Reported symptoms of urgency and urge incontinence may be particularly difficult to interpret clinically in men because they might indicate detrusor instability or bladder outlet obstruction causing uninhibited contractions. The medical evaluation of UI is similar for men and women; men being evaluated for UI need a postvoid residual. Noninvasive measurement of urine flow may add to the diagnostic accuracy of detecting bladder outlet obstruction, but the
results may not agree with results obtained by pressure-flow studies. Prostate surgery can result in UI, and biofeedback can be an effective treatment. Near-continual leakage after prostate surgery seems to be most responsive to artificial sphincter implantation. Male nursing home patients with UI present a different challenge in that mental and physical dysfunction must be addressed. Staff-dependent interventions are the most appropriate.

References


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