ABSTRACT

The prevalence of urinary incontinence varies by definition, age, and sex. Urinary incontinence defined as leakage during 6 days in the past 12 months occurs in a mean of 41% (range, 12% to 53%) of women. For those with leakage twice per month, the prevalence is a mean of 14% (range, 5% to 37%), and for those with any frequency that the patient views as a problem, mean prevalence is 24% (range, 12% to 44%). In middle age, incontinence is much more frequent in women, but in older adults, it also becomes a health problem for men. In the 35- to 44-year-old age group, the ratio of women to men who have urinary incontinence is approximately 10:1. This ratio decreases to 1:1 in patients older than 85 years. Urine leakage usually occurs under 2 conditions: with physical exertion, sneezing, or coughing (stress incontinence) or preceded by a strong and urgent desire to void (urge incontinence). Age, obesity, and vaginal delivery are risk factors; age appears to be the strongest predictor of incidence. Urinary incontinence often leads to social isolation, physical limitation of activities, avoidance of sexual activity, decreased work productivity, and depression. Careful patient history and physical examination constitute the basic evaluation for the condition. Because of the impact of urinary incontinence on quality of life, identification and treatment are essential.

support that maintains the anatomic position of the ure-thra. Both of these types of malfunctions can cause stress incontinence and can occur in the same person. Complicating diagnosis further, not every case of clinical urge incontinence is diagnosed as detrusor overactivity on examination, just as not all stress incontinence is due to a poor response to increased bladder pressure.

It is possible, however, to differentiate urge from stress incontinence. As shown in Table 1, a marker of urge incontinence is nighttime wakening with urge. However, the absence of this symptom does not rule out urge incontinence. Leaking during physical activity is a diagnostic marker for stress incontinence. Urgency and leakage due to urgency are the 2 most important signs of urge incontinence. However, physical exertion, such as a Valsalva maneuver, may sometimes trigger involuntary detrusor contraction (usually associated with urge incontinence), confusing the identification of the underlying etiology. In patients with urge incontinence, a brief delay should occur between the execution of the Valsalva technique and urine loss. The amount of urine loss is also frequently higher in patients with urge incontinence compared with stress incontinence, but that detail may be obscured: sometimes the amount of urine loss with urge incontinence is small because of good sphincter control. In practice, there may be overlap among symptoms between stress, urge, and other types of incontinence. Also, urge incontinence is part of the general condition of overactive bladder, which includes urge incontinence as well as sudden, strong urges to urinate or frequent urination.

Two other types of incontinence that may be encountered in primary care are overflow and functional incontinence. Overflow incontinence is due to outflow obstruction (eg, in men with enlarged prostates) or a weak detrusor contraction. It is seen rarely in women, although it occurs occasionally with severe pelvic prolapse or in women who have urethral scarring resulting from instrumentation. It is most commonly seen in people with neurologic damage from long-standing diabetes or spinal cord injury. Functional incontinence refers to incontinence not due primarily to a physiologic problem in the urogenital system but may be due to dementia or reduced mobility.

**Demographics of Urinary Incontinence**

The prevalence of urinary incontinence varies by definition, age, and sex. Urinary incontinence defined as leakage during 6 days in the past 12 months occurs in a mean of 41% (range, 12% to 53%) of women. For those with leakage twice per month, the mean prevalence is 14% (range, 5% to 37%), and for those with any frequency that the patient views as a problem, mean prevalence is 24% (range, 12% to 44%).

![Figure 1. Primary Underlying Causes of Incontinence](image)

Urgo incontinence is caused by detrusor instability. Stress incontinence is caused by diminished urethral sphincter function and/or urethral hypermobility.

<table>
<thead>
<tr>
<th>Table 1. Symptoms Differentiating Stress from Urge Incontinence</th>
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<tbody>
<tr>
<td>Symptoms</td>
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<tr>
<td>Leaking during physical activity (coughing, sneezing, lifting)</td>
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<tr>
<td>Inability to reach the toilet in time following an urge to void</td>
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<tr>
<td>Urgency accompanies incontinence (strong, sudden desire to void)</td>
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<tr>
<td>Waking at night to urinate</td>
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</tbody>
</table>
The prevalence of incontinence increases with age for both men and women, although the peak prevalence occurs at different ages according to sex (Figure 2). The discrepancy between the sexes begins in the teen years, when urinary incontinence is more common in females than males. By middle age, incontinence is a much more frequent health condition for women, but in older adults, it also becomes a health problem for men. In the 35- to 44-year-old age group, the ratio of women to men who have incontinence is approximately 10:1. This ratio decreases to 1:1 in patients older than 85 years.

Type of incontinence also varies with age in women. In women younger than 60 years of age, stress incontinence accounts for 55% of cases, followed by mixed (25%) and urge incontinence (20%). These percentages change for urge (35%), mixed (35%), and stress incontinence (30%) in those older than 60 years.

The predominant risk factors for urinary incontinence are female sex, parity, and obesity. Vaginal delivery is the primary risk factor in women who have had 1 or more vaginal births compared with women who have had none. The prevalence of urinary incontinence up to 5 years after delivery is 30% among all women but can be as high as 92% in those who are incontinent during pregnancy or puerperium and remain incontinent 3 months after delivery. The risk increases most with 1 vaginal birth and generally increases modestly with subsequent births. Obesity has been found to be another factor related to the development and recurrence of incontinence. Resolution of incontinence has been reported (albeit more subjectively) in morbidly obese women who have lost weight after bariatric surgery. A few studies have also shown that stress incontinence may be more common in white women compared with African American women, although the studies have typically been small.

**THE BURDEN OF DISEASE**

Urinary incontinence is more prevalent than any of the more common chronic diseases in women, such as hypertension, depression, and diabetes (Figure 3). In institutionalized patients, the prevalence is about 50%. These patients are elderly, and their incontinence is either transient (often due to medications) or established. Established incontinence is usually refractory to medical treatment and is often caused by neurologic damage or intrinsic urinary tract dysfunction.

Annual direct costs of incontinence range from $16 million to $26 million (in 1995 dollars), expenditures that reflect about the same costs as those for osteoporosis or breast cancer. Costs for women older than 65 years of age were more than twice the costs for those younger than 65 years ($7.6 and $3.6 billion, respectively). In those older than 60 years, the largest cost category was routine care (70% of costs for women), followed by nursing home admissions (14%), treatment (9%), complications (6%), and diagnosis and evaluation (1%).

The most important aspect of incontinence is its impact on quality of life. Incontinence inflicts a heavy emotional toll on patients' sense of well-being, affecting several quality-of-life indicators, such as social, physical, sexual, psychological, occupational, and domestic indicators. About 25% of women report “some bother” from incontinence, and only a slightly smaller percentage say they are “severely bothered” by the symptoms. As a patient population, this represents a substantial number of women, most of whom are not being treated for the condition.

Individuals with incontinence suffer from isolation, reporting that they are less likely to travel or to attend social events or visit family. For women in mid-

![Figure 2. Prevalence of Urinary Incontinence by Age and Sex](https://example.com/figure2.png)

dle age, stress incontinence specifically limits leisure activities that would be of most health benefit, such as physical exercise and sports participation. Incontinence also leads to avoidance of sexual activity, and its association with depression and loss of self-esteem is fairly strong. Decreased productivity has been linked to stress urinary incontinence. For some women, certain jobs are prohibitive because of inadequate access to bathrooms or allowance for the requisite number of bathroom breaks. Urinary incontinence has become such a pervasive influence on quality of life that it has been proposed as a basis for outcomes measures among patients in nursing homes.  

**Evaluation**

The basic evaluation for incontinence is based on a thorough history (including a voiding diary) and physical examination with urinalysis.

**History**

Obtaining patient history involves asking medical, neurologic, and genitourinary questions to rule out diabetes, congestive heart failure, stroke, neurologic disorders, and pelvic organ prolapse. A surgical history is also important, regarding surgery in the abdomen or pelvic area. A complete list of medications—particularly diuretics, central nervous system depressants, cholinergics, and alpha antagonists, all of which can affect bladder function—is necessary. Diet is also important to determine because of evidence—albeit limited—that spicy foods, caffeine, and alcohol can be bladder irritants, especially for women with more urge incontinence symptoms.

There are several methods to screen for incontinence. The most successful way to determine the presence of incontinence involves direct questioning under circumstances that are comfortable for the patient. Queries that may aid in identifying incontinence include, “Many women sometimes experience a problem with leaking urine accidentally. Has that ever happened to you?” If the patient concurs, follow-up questions can be used to differentiate between stress and urge incontinence. Positive responses to, “How many times have you actually leaked urine with a physical activity like coughing, sneezing, lifting, or exercising?” suggest a stress component. In contrast, urge incontinence can often be detected by inquiring, “Did you have a feeling of a strong, sudden need to pass your urine that did not allow you to get to the toilet fast enough?”

The corresponding pathology associated with urge incontinence—detrusor instability—often is recognized by a patient, who feels the involuntary muscle changes that proceed unwanted voiding. Conversely, in stress incontinence, such triggers include laughter, coughing, sneezing, or some physical exertion. A large majority of patients who report stress incontinence are women and are generally middle-aged or older.

A voiding diary may be helpful in several ways. Diaries can help with diagnostic confirmation of type of incontinence or, if the patient has mixed incontinence, can assist in determining which type predominates. In general, patients are adept at recording both storage and expulsion of urine accurately during the day, even though the voiding diary for incontinence can be complex. From such patient-rendered recordings, patterns will emerge. Diary recordings also actively engage patients in the care of their condition. A sample voiding diary is shown in Figure 4. Columns 1, 3, and 5 are most important, and the diary can be simplified to only those 3 columns for some patients, depending on

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**Figure 3. Urinary Incontinence Is More Prevalent than Other Chronic Diseases in Women**

![Image](image_url)

*All types of urinary incontinence combined.

Data from: Hampel et al; American Heart Association; American Academy of Family Physicians; National Institute of Diabetes and Digestive and Kidney Diseases.
the symptoms and the patient's circumstances. In some patients, the incontinence will improve by just keeping the diary.

**Physical Examination**

Abdominal Examination. An abdominal examination is important to detect masses, organomegaly, ascites, and other physical causes that can increase abdominal pressure and lead to incontinence. The bladder examination is less important because even when there is significant residual urine, it is often difficult to palpate the bladder, particularly in heavier women.

Vaginal Examination. The vaginal examination is essential, and the key areas of assessment are outlined in Table 2. In general, the physician looks for the possibility of prolapse and the occurrence of masses and assesses pelvic floor strength. One method that aids in such assessment is to have the woman contract the vagina around the physician's fingers during a manual examination (ie, Kegel exercises) to establish voluntary control and assess the strength of the pelvic floor. The degree of estrogenization of the vagina is also important to assess by looking at the quality of the skin based on tone, thickness, and dryness. Fecal impaction is an important reversible cause of incontinence, especially in the elderly, and should always be determined in incontinent patients.

Neurologic Examination. The sacral neurologic examination is a component of the pelvic examination. It is performed to test perineal sensation, anal sphincter strength (through voluntary contraction of the anal sphincter), and lower extremity function and muscle strength. In a woman without neurologic symptoms, this examination can be done by testing the bulbocavernous and anal wink reflexes.

**Urinalysis.** Urinalysis is recommended in all women with incontinence. Urinary tract infections will more frequently cause urgency symptoms rather than stress incontinence, so performing the test is worthwhile. Testing for hematuria, pyuria, glycosuria, and proteinuria should also be completed.

**Pad Test.** Several other tests are helpful in confirming diagnosis and in making treatment decisions for women with urinary incontinence. The pad test is not often done in a primary care setting because it is

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**Table 2. Rectal and Vaginal Examination for Incontinence**

- Prolapse
- Mass
- Voluntary pelvic floor contraction
- Perineal skin condition
- Pelvic floor muscle tone
- Palpation of anterior vaginal wall and urethra
- Assess strength and voluntary control of levator muscles
- Determine degree of estrogenization
- Cotton-swab test
- Fecal impaction
more of a research tool used to quantify urine loss. Patients are given a pad of predetermined weight and asked to wear it for 24 hours, at which time the pad is weighed again.

Stress or Cough Test. The stress or cough test is simple to perform and provides objective assessment of stress urinary incontinence. A woman with a full bladder is asked to cough or undergo a Valsalva maneuver, in lying, standing, and seated positions. By holding a pad at the urethra, urine leakage can be detected.

Cotton-Swab Test. The cotton-swab test is especially useful if the woman is being considered for surgery, but it is also used to gauge the general degree of urethral support. A moistened cotton swab is placed in the urethra, and the woman is asked to bear down in a Valsalva maneuver. Normally, an exertion of the distal part of the cotton swab of 10 degrees or less will occur as a result of pressure being applied to the proximal end of the urethra. This technique reflects a normal amount of movement of the pelvic floor. In women with a hypermobile urethra, the movement will be much greater—usually 30 degrees or more. This larger movement does not rule out intrinsic sphincter deficiency, but if the movement is not detected and the patient has stress incontinence, it implies intrinsic sphincter dysfunction rather than a pelvic floor support or hypermobility problem. The cotton-swab test is more an anatomical test than a diagnostic test for stress incontinence.

Postvoid Residual Test. The postvoid residual test measures the amount of urine remaining in the bladder after voiding to determine if voiding is incomplete. Catheterization of the bladder is required after the woman has voided. Although this test can be performed in the office setting, it needs to be performed only in women with symptoms of retention or obstruction, which are relatively uncommon.

Urodynamic Testing. Urodynamic testing is achieved with either "eyeball cystometry" or multichannel urodynamic studies. Neither of these methods is usually performed in primary care; however, it is useful to be familiar with them. Eyeball cystometry involves filling the bladder through a catheter. The bladder is first filled to the point where the patient feels a sensation to void, then to the point where she feels unable to avoid elimination. The syringe is held approximately 15 mm above the symphysis pubis, and the physician watches for rises and falls in the meniscus, which indicate detrusor contraction. At that point, the catheter is removed, and the patient performs a cough test for stress incontinence. The patient is then asked to void, and the time required to begin voiding and the size, force, and continuity of the urinary stream is recorded. The amount of urine, duration of voiding, and presence of straining, hesitancy, and dribbling are also recorded.

Multichannel urodynamic studies include cystometry to assess bladder filling, pressure flow studies and uroflowmetry to assess voiding function, and leak-point pressures or urethral pressure profiles to assess urethral function. Cystometry assesses bladder pressure-volume relationships within the bladder. After voiding, the patient lies down, and a catheter is positioned in the bladder; any urine left in the bladder is measured and recorded. Next, thermal sensation is evaluated. Room temperature saline solution is placed into the bladder, followed by warm water. The patient is asked to indicate any sensations, and the water is drained from the bladder. Finally, pressure within the bladder is measured during filling. A cystometer is connected to the catheter, and water or saline is slowly introduced into the bladder at a controlled rate. As with eyeball cystometry, the patient will indicate when the need to void is first felt. The pressures and volumes are recorded. When the bladder is full, voiding studies are performed. The patient voids, and the pressure of the voiding is recorded. The bladder is again drained of any residual urine, and the catheter is then removed. Electromyographic activity of the pelvic floor in response to bladder capacity, first and filling sensations, bladder compliance, and leak-point pressures may also be measured.

Conclusion

Urinary incontinence is a common problem, particularly for women of childbearing age and all older adults. It has significant negative impact on numerous aspects of quality of life. Because it is an embarrassing condition, many patients do not discuss their incontinence with their physicians; the condition therefore remains untreated or undertreated. Increasingly, the treatment of incontinence occurs in a primary care setting rather than a specialty practice. This form of care lends itself to long-term patient-physician relationships, in which trust builds with time.
REFERENCES


