

## **Urinary Incontinence**

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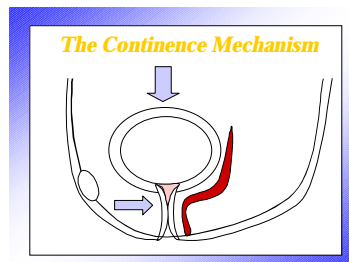
The involuntary loss of urine at socially unacceptable times occurs in both women and men, but more commonly in women. It has multiple, far-reaching effects on daily activities, overall health and social interactions. Since many are unwilling to discuss such a sensitive topic—even with their physician, it is difficult to know the prevalence of incontinence with certainty, but it is estimated that; 3-14% of women in the community, 30-40% of older women, and as many as 70% of women in nursing homes have incontinence that is considered a consistent social or hygienic problem.

Patterns have developed that show some women to be at higher risk than others for urinary incontinence. While even college women who are healthy can have occasional incontinence, it seems to occur most often in women who: are elderly, have other medical problems such as diabetes, have limited mobility, are in menopause, are overweight, or smoke. Most importantly, there seems to be a very high association between urinary incontinence and having delivered babies vaginally, particularly if there were any complications such as prolonged labor, lacerations to the birth canal, or use of forceps.

The impact of urinary incontinence on an individual, her sense of self and her sexuality, as well as her ability to function in a social environment can only be estimated. Moreover, there are significant effects on a person's family from an economic, emotional, and interpersonal standpoint. Even health care professionals can become overwhelmed and "burned out" when faced with the additional care responsibilities, and this can compromise the quality of care a patient receives. The cost to the nation's economy during 1994 was estimated in the tens of billions of dollars. A large percentage of this cost was related to supply items such as laundry, pads, and absorbent underpants.

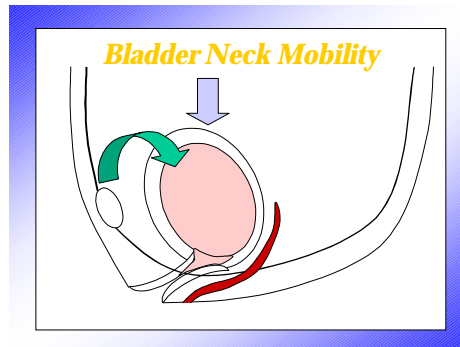
Clearly, urinary incontinence is a major health and quality of life concern. You may have noticed ads on television for medications aimed at treating "overactive bladder". This would seem to indicate that as a society, we are starting to recognize at least the quality of life issues associated with urinary incontinence, but there are many different types of incontinence, and unfortunately a cure-all does not exist. Therefore, in this section, we will discuss the different types of urinary incontinence along with the mechanism of each as currently understood. Additionally, we will review the common diagnostic tests and procedures that may be performed to help distinguish between the different types of urinary incontinence. Finally, we will outline the treatment methods based on the best evidence currently available. Fortunately, wearing pads to keep one's clothes dry is not considered a primary treatment option for any of the types of urinary incontinence.

### **What Causes Incontinence?**



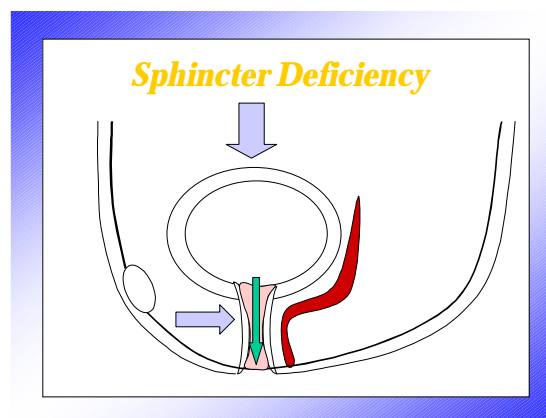
### The continence Mechanism

The diagram above depicts the floor of the pelvis, the bladder and the front wall of the vagina, which supports the bladder. Normally, as in this diagram, the bladder is well supported in the pelvis above the pelvic floor. The vagina gives firm support to the bladder and urethra, so when pressure (from a cough, laugh, or sneeze) reaches the pelvic floor, it is distributed equally around the bladder and urethra. The pressure on the urethra (the lower arrow) helps close the urethra against the firm support of the vagina and keep the pressure in the urethra higher than the pressure in the bladder, and the urine stays in the bladder.



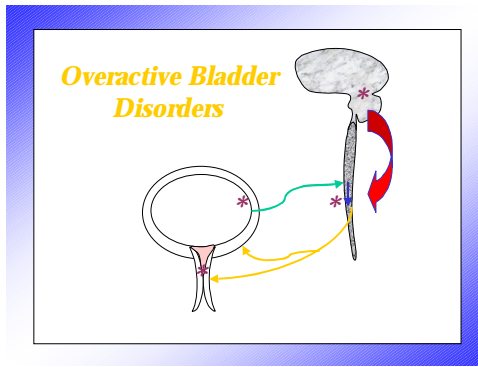
### Bladder Neck Mobility

If, through damage to the pelvic floor muscles or nerves, or due to the effects of aging, the pelvic floor no longer supports the pelvic organs, the bladder will rotate down (green arrow) out of its normal position with straining. When this occurs, there is no longer the normal firm support underneath the urethra, and during straining, pressure becomes higher in the bladder than in the urethra, and urine leaks out of the bladder in spurts.



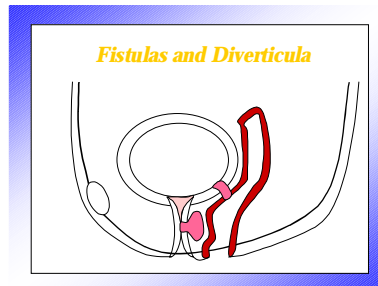
### Sphincter Deficiency

Another possible cause of leakage of urine with cough or sneeze is loss of control of the muscles that surround the urethra. This can occur as a result of prior surgery, radiation treatment, or injury to the nerves of the pelvis. As the diagram shows, the support of the pelvic floor may be normal, yet because the urethral muscles cannot help keep the pressure inside the urethra high, the bladder pressure overcomes the urethral pressure easily and often, and urine leaks out. This condition is suspected most often in individuals who have had prior surgery that failed, or have episodes of leakage with normal daily activities such as walking, or those who are unaware that they are having incontinence.



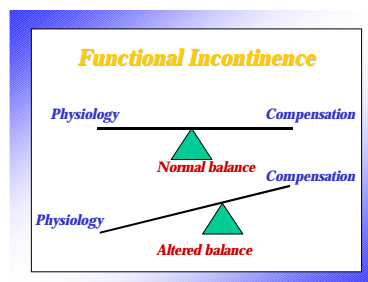
### Overactive Bladder Disorders

Complex neurologic systems are at work to coordinate the bladder. Normally, it must remain relaxed and allow itself to fill until near capacity. During this time, the muscles in the urethra normally contract which helps keep urine in the bladder. When the bladder is full, it begins to contract in coordination with relaxation of the muscles in the urethra. This allows the bladder to empty. As we mature, we gain some voluntary control over this process, and can hold our urine until a socially acceptable time to empty. In the overactive bladder disorders, some or all of that control is lost. The bladder assumes “a mind of its own”, and empties despite the attempts of the individual to hold her urine. Although there are some conditions commonly associated with this kind of incontinence such as neurologic problems, bladder stones, infection, mental illness, or even orgasm, most of the time the cause cannot be pinpointed. Individuals with this type of urinary incontinence often have to use the restroom very often during the day, and must get up several times each night to urinate. Even then, they may not make to bathroom in time.



### Fistulas and Diverticula

Another cause of incontinence of urine is an abnormal connection from the bladder to the vagina (a fistula), or a pocket of tissue connecting to the urethra (a diverticulum). These can result from previous infection of the normal glands that surround the urethra, or can unfortunately be the result of previous surgery. Since a fistula allows urine to bypass all normal mechanisms of storage and release, the individual will experience nearly constant leakage of urine.



### Functional Incontinence

Situations may arise where the urinary tract functions normally, but due to additional circumstances, the normal continence mechanisms are overcome and the “balance” tips in favor of incontinence. These may include mental illness, bladder infection, estrogen deficiency, side-effects of medications, limited mobility, or impaction of stool. In these situations, correction of the incontinence may only require either correction of the factor that caused the imbalance, or possibly a minor treatment to add weight to the continence side of the balance.

### Evaluation for Urinary Incontinence

- **History:** As with any medical condition, evaluation begins with obtaining as much information as possible. Questioning is designed to cover several important areas of pelvic floor function such as: the particular circumstances of an individual's incontinence, the ability of the bladder to empty normally, bowel function, pelvic pain, and sexual function. The answers a patient gives serve as important clues to exactly where a patient's problem lies. It is common for a Urogynecology Clinic to use questionnaires, even to mail them to the patient before the visit, to make collection of this important information more efficient. It is also common for the clinic to request that the patient fill out a diary of her voiding habits over 1-7 days. This information also gives important clues as to which kind of incontinence a person may have.

A patient can also expect to be asked in detail about any other medical illnesses she may have, all medications and medication reactions, any prior surgeries, the circumstances surrounding all her deliveries, any prior infections, and what her normal duties and social habits consist of.

- **Physical Exam:** The examination is targeted at those systems which help support the bladder and maintain continence. In particular, sensation of the perineal area, reflexes that involve the pelvic nerves, the muscles of the pelvic floor, the skin as an estimation of the overall strength of connective tissue, and of course the supports of the bladder, urethra and bladder neck will be evaluated. The amount of urine remaining inside the bladder is determined with a small catheter. The physician tries to determine which organs in the pelvis have lost support of the connective tissue, and how severe that loss of support is. By this point in the evaluation, the physician is likely to have a pretty good idea of the cause of urinary incontinence.
- **Urine culture:** When a urinary tract infection is present, the symptoms of incontinence may be present and can mimic either anatomic incontinence, or overactive bladder. The symptoms are not always classic, so it is wise to prove in every patient with incontinence that a urinary tract infection is not present.
- **Urodynamics:** At times the picture is not crystal clear, and more information is useful to make an accurate diagnosis. If surgery appears to be the best solution, at times more information is needed to help plan the surgery. “Urodynamics” refers to an outpatient study that involves positioning in a special chair and placement of very small catheters which have pressure sensors into the bladder, and either the vagina or rectum. The goal is to observe the behavior of the bladder and urethra as the bladder is filled slowly with sterile water. If the bladder is overactive, the pressure will rise, and this pressure change can be measured. With the bladder filled to a specified volume, coughing and straining are performed to allow measurement of the pressures on the bladder that will cause an individual to leak urine. Additionally, a device will pull the catheter slowly through the urethra to measure the pressure generated by the muscles in the urethra. These studies help determine if the cause of incontinence is anatomic, a sphincter deficiency, or an overactive bladder. Finally, once the bladder is full, the patient is asked to empty her bladder while the volume and rate of flow are measured. This helps determine if the bladder and urethra

function normally, whether there is an obstruction, or if straining is required to pass urine.

- **Cystoscopy:** When overactive bladder is suspected or diagnosed, or if a fistula or diverticula is suspected, very useful information can be obtained by looking directly into the urethra and bladder with a very small telescope. This is known as cystoscopy. It is usually performed after placing an anesthetic gel in the urethra. The patient is placed in a special examining chair, and the cystoscope, which is only a few millimeters in diameter, is passed into the urethra while sterile water is running into the bladder. The physician can observe the health of the urethra, and can observe the response of the urethra and bladder neck to the patient's attempts to squeezing to hold urine, or to coughing or straining. Any holes into the vagina (fistula) or pockets(diverticula) can be seen as well. After the urethra is examined, the physician will then advance the cystoscope into the bladder and systematically examine the entire bladder wall for evidence of anything that may account for the symptoms. This may include: evidence of long term infection or irritation, bladder stones or tumors, evidence that the bladder wall muscle has been overworked, or the presence of sutures piercing the bladder wall (which is uncommon).

Urodynamics and Cystoscopy help correlate symptoms with findings, improve diagnostic accuracy, and help fine tune the treatment recommendations. As many as 15-40% of diagnoses are incorrect if urodynamics and cystoscopy are not performed. Also, in 25-30% of cases, there was an additional diagnosis that would have been missed, had it not been for performing urodynamics and cystoscopy. By the conclusion of the examinations and studies listed above, the physician is usually able to determine the cause of urinary incontinence, and is in a position to make a recommendation for treatment.

#### Treatment Options:

Just as there are many different causes of urinary incontinence, there are also many treatments methods. The goal is to match the proper treatment to the correct diagnosis. Treatment may be non-surgical, or surgical.

- **Non-surgical treatments**
  - **Medications:** particularly helpful in overactive bladder with 50-60% improvement, but also help about 40% on individuals with stress incontinence
  - **Physical therapy:** consists of pelvic muscle exercises such as Kegels, biofeedback, electrical stimulation, and bladder training drills, improves 40-50% of those with stress incontinence, and 30-40% of those with overactive bladder
  - **Continence Devices:** may be small disposable devices designed to fit in the urethra temporarily to hold the urine by blocking the urethra, then to be removed when the individual desires to urinate, (improvement 30-40% of the time); or Pessaries, which are devices designed to fit in the vagina and provide support to the bladder neck (improvement 30-40% of the time)
- **Surgical treatments**
  - **Burch Procedure:** elevates the bladder neck restoring the firm support for the urethra during straining (successful 80-85% of the time for stress incontinence)
  - **Sling procedure:** performed in cases of sphincter deficiency, places "sling" of tissue behind the pubic bone, under the urethra, and suspended from the abdominal wall muscles, provides dynamic support to the urethra (successful 85-90% of the time)
  - **Periurethral injections:** an office procedure using the cystoscope, a needle is advanced beneath the urethral lining to place an injection of collagen which helps

occlude the bladder neck (most useful in sphincter deficiency without loss of support, successful 50-60% of the time)

- Sacral Nerve Stimulators: most useful in overactive bladder not responding to medication, involves placing wires near the nerves in the sacral area and stimulating them with a low electric current by an implantable “pacemaker”, seems to reset the sensitivity of the bladder wall (60-80% success rate in properly selected patients, involves a test stimulation that lasts one week)

**Conclusion:**

Urinary incontinence is a very common condition which is often debilitating to those who suffer from it. As the health of the women of the United States continues to improve, women can expect to spend as much as one third of their lives in the menopause. Moreover, as the proportion of women in their 80s and even in their 90s continues to increase, it becomes essential to seek out reliable effective treatments for urinary incontinence, and to continue to improve the ability to accurately diagnose this condition. At Johns Hopkins Hospital, we are dedicated to these ends.