



**The American Urological Association
Female Stress Urinary Incontinence Guidelines Panel**

The Surgical Management of Female Stress Urinary Incontinence

A Doctor's Guide for Patients

Female Stress Urinary Incontinence Guidelines Panel

Members:

Gary E. Leach, MD, Chair
Roger R. Dmochowski, MD, Facilitator
Rodney A. Appell, MD
Jerry G. Blaivas, MD
H. Roger Hadley, MD
Karl M. Luber, MD
Jacek L. Mostwin, MD
Pat D. O'Donnell, MD
Claus G. Roehrborn, MD

Consultants:

Hanan S. Bell, Ph.D.
Patrick M. Florer
Curtis Colby

Foreword

Unwanted loss of urine during physical activity is a very common problem, impairing quality of life for large numbers of women young and old. It is also a very treatable problem. We have produced this guide for women like you whose treatment choice is surgery. The guide shows how your urinary system works and discusses causes of unwanted urine leakage and how they are diagnosed. The guide then discusses the major types of surgery for correcting your problem, including their success rates and the possible complications that may occur. We hope that this information will help you better understand both your condition and the surgical procedures for treating it.

– *The American Urological Association
Female Stress Urinary Incontinence Clinical Guidelines Panel*

What is stress urinary incontinence?

Urinary incontinence is the uncontrolled leakage of urine. The problem is widespread and afflicts an estimated 13 million adults in the United States alone. Approximately 85 percent of those afflicted are women.

This *Doctor's Guide for Patients* is for women who suffer from **stress incontinence**, a type of

urinary incontinence in which the leakage occurs with physical activity such as coughing and laughing. Stress incontinence can be treated both surgically and nonsurgically. This guide is intended mainly for women who are choosing surgery as their treatment method.

The Urinary System

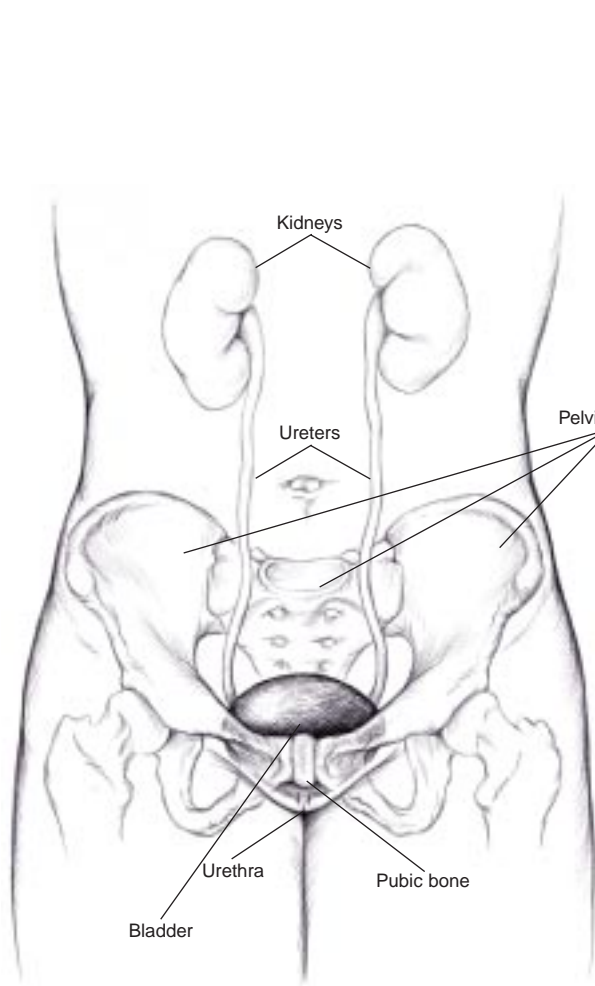


Figure 1. Front view of female urinary tract.

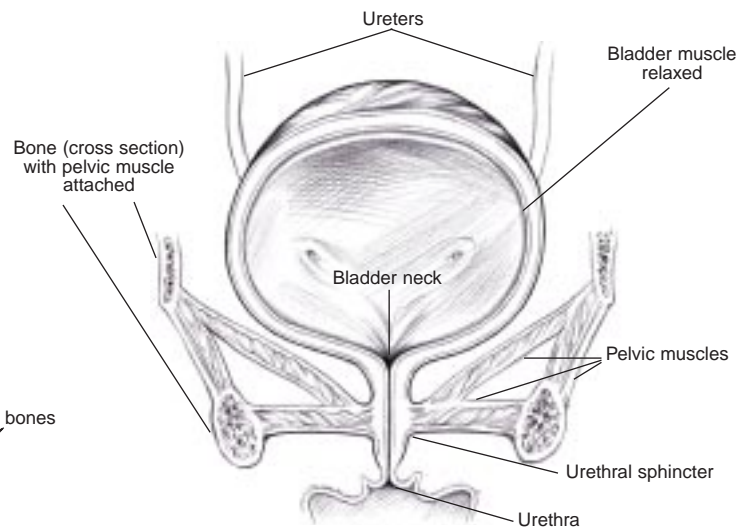


Figure 2a. Front view of lower urinary organs with bladder neck closed.

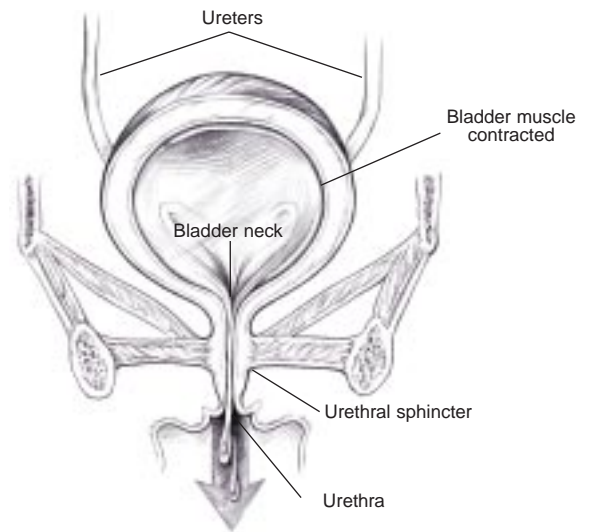


Figure 2b. Front view of lower urinary organs with bladder neck open to allow urination.

Illustrations prepared by Tim Phelps, Baltimore, MD.

The urinary system begins with the kidneys, where urine is produced. The kidneys filter waste products out of the blood. The urine carries these waste products out of the body. Urine flows from the kidneys through the ureters to the bladder. From the bladder, the urine flows through the bladder neck and out of the body through the urethra.

Figure 1 on page 1 shows the main urinary organs that take part in this process. Also shown are the pelvic bones. All the body parts illustrated or discussed in this guide are described in the glossary on page 8.

Figures 2a and 2b on page 1 show healthy urinary organs at work inside the bowl-shaped area formed by the pelvic bones. The largest urinary organ here is the bladder. Many people think of the bladder only as a kind of bag to hold urine. It is actually a muscle. Like other muscles, the bladder can contract (tighten) or it can relax, acting on signals from the brain sent through the nervous system.

In a healthy urinary system, like the one shown in these illustrations, the bladder works together with the urethral sphincter, the bladder

neck and other pelvic muscles to control the flow of urine. See the glossary for definitions of the urethral sphincter and bladder neck. Like the bladder, both are muscles and can contract or relax.

Figure 2a illustrates what happens after the brain sends the signal to hold in the urine. The bladder muscle relaxes, so there is no pressure to force out the urine. Meanwhile the urethral sphincter and other muscles contract, helping to keep the bladder neck closed so that no urine can escape.

Figure 2b depicts what happens with urination. The brain has sent the signal to release urine from the bladder. The bladder muscle now contracts to help force out the urine. The urethral sphincter and other muscles relax. The bladder neck stays open, and the urine flows out through the urethra.

Urinary control also depends on a seal mechanism inside the urethra that works together with, but independently of the outside sphincter. This internal seal mechanism acts like a washer in a water faucet. With the internal seal mechanism and outside sphincter muscles working together, the urethra is able to seal and unseal itself.

Stress urinary incontinence and its causes

The word “stress” in the term **stress urinary incontinence** does not mean emotional stress. The stress here is physical. It refers to increased pressure on the bladder from ordinary physical activities. These activities may range from lifting a bag of groceries to sneezing, coughing, laughing or rising from a sitting to a standing position. In stress incontinence, the time period during which leakage occurs may be quite short and the amount of leakage quite small.

Most women with stress urinary incontinence have weakened pelvic muscles. Some of the pelvic muscles are pictured in Figures 2a and 2b. They support the bladder, bladder neck and urethra. Among the reasons the pelvic muscles may have weakened are pregnancy, childbirth and prior pelvic surgery.

With weakened support, the bladder neck and urethra may shift from their normal positions. Out of position, they may drop momentarily when there is pressure on the bladder from an activity

such as coughing. This downward movement can cause the bladder neck and urethra to open briefly, resulting in urine leakage as shown in Figure 3.

The medical term for this condition is **urethral hypermobility**. “Hyper” means too much, and “mobility” refers to movement. Urethral hypermobility is the most common cause of female stress incontinence.

Another possible cause of stress urinary incontinence is weakened urethral sphincter muscles, together with loss of the internal seal effect described above. As a result, the sphincter does not function normally, no matter what the position of the bladder neck and urethra.

A defective sphincter may not be able to completely seal off the flow of urine, especially during physical activities. The medical term for this problem is **intrinsic sphincteric deficiency**, usually referred to by the initials **ISD** (see glossary definition on page 8).

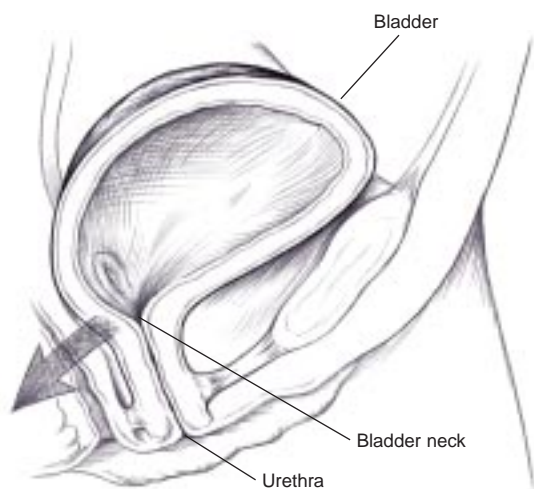


Figure 3. Urethral hypermobility. The arrow indicates direction of pressure from an activity such as coughing, causing the bladder neck and urethra to open briefly.

ISD is unrelated to the more common condition of urethral hypermobility, described on page 2. However, both ISD and urethral hypermobility may exist in the same patient at the same time.

Another problem that may exist, along with urinary incontinence in women whose pelvic muscles have weakened, is **pelvic organ prolapse**. “Prolapse” is a general term that refers to a body part slipping out of place. Here the fallen body part is a pelvic organ such as the bladder. Because the supporting pelvic muscles have weakened, the organ protrudes into the vagina. The vagina itself may drop.

Symptoms of pelvic organ prolapse include vaginal discomfort, a sensation of pressure within the vagina or bulging of the vagina itself through its opening.

Other types of incontinence that may be present

Many women with stress incontinence experience other symptoms besides leakage during physical activity. These symptoms may indicate another type of incontinence. **Urge incontinence**, for example, often accompanies stress incontinence. Urge incontinence is experienced as a sudden strong urge to urinate along with a sudden uncontrollable rush of urine. This may occur at any time.

Usually the cause is an overactive bladder, which may contract even when a person does not want to urinate. A combination of urge incontinence and stress incontinence is called **mixed**

incontinence. Identifying the presence of urge incontinence is important. Surgery can cure stress incontinence, but urge incontinence may require other kinds of treatment (such as medications).

Overflow incontinence may also be present. This type of urinary incontinence is usually experienced as a frequent or constant dribble. Urination produces only a weak stream, and the bladder never completely empties.

Possible causes include an underactive bladder muscle. The muscle may have stopped contracting in reaction to a particular medication or because of nerve injuries or damage to the bladder muscle.

Diagnosing the causes of urinary incontinence

The investigation to find the causes of the leakage begins with a **medical history**. The doctor will ask for information such as number of pregnancies and deliveries, what illnesses and injuries the patient has had, what medications she has been taking and whether she has had prior surgery and, if so, what kind.

The doctor will also interview the patient about her present incontinence symptoms and

how they affect daily life. The patient may be asked to keep a diary (called a voiding diary), in which she records each time she urinates during a 24-hour day, each time uncontrolled leakage occurs and each time she drinks fluids.

The doctor will analyze the patient’s urine sample in the laboratory for signs of infection or other problems.

A **physical examination** will include both a vaginal and a rectal examination. The doctor will test nerve function and check the anatomy for features that may contribute to incontinence or affect treatment.

An important purpose of the physical examination is to observe and evaluate urinary incontinence while loss of urine is actually taking place. One method is to insert a thin tube called a catheter into the urethra and fill the bladder through this catheter. After the bladder is full, the catheter is removed. The patient then performs physical stress maneuvers such as coughing to see whether urine loss occurs, how it occurs and how long it lasts. The results may help identify what is causing the patient's incontinence. For example, continued loss of urine after the patient has

stopped performing stress maneuvers may indicate an overactive bladder muscle.

Additional testing may be performed to measure bladder pressure and rate of urine flow. This is known as urodynamic testing. The results may tell the doctor under what circumstances leakage occurs and what the bladder is doing at the time.

At the end of the diagnostic investigation, the patient and doctor should know approximately how much of the stress incontinence is caused by urethral hypermobility and how much by ISD. This knowledge is important in selecting a surgical procedure for treatment. In addition, the diagnostic investigation should reveal how much other factors, such as an overactive bladder muscle, may be contributing to the incontinence.

Surgical treatments for stress urinary incontinence

For treating stress urinary incontinence due to urethral hypermobility (described on page 2), many surgical procedures have been developed. All have the same goal. They all seek to create support for the urethra and bladder neck to prevent downward sag and urine leakage during physical activities. However, each procedure achieves this goal in a different way.

The many procedures for correcting urethral hypermobility, when grouped according to type of surgery, make up three general categories. These categories are: **retropubic suspensions**, **transvaginal suspensions** and **sling procedures**. The individual procedures grouped together within each category differ from one another to some degree, but are basically similar in their surgical approach. See Figures 4a, 4b and 4c for illustrations.

If the stress incontinence is entirely or partly caused by ISD, the treatment goal is to restore normal functioning of the sphincter and internal seal mechanism. (See the description of ISD on page 3.) The most effective surgical procedures for treating ISD appear to be those in the sling procedure category (Figure 4c). Suspension procedures, retropubic or transvaginal, have poor results in patients with ISD.

Another type of treatment, **collagen injections**, may also be an option for patients

with ISD. Collagen is a common substance in animal bones and connective tissue. The collagen for treating ISD is extracted from cattle, purified and prepared for use as an injectable agent. It is injected into or around the urethra. The result is "bulking" of tissue. This helps the internal seal mechanism close off the flow of urine.

Collagen is injected under local anesthesia. There are no known long-term complications from the injections. However, collagen's effectiveness decreases over time. Reinjection is usually necessary within a year after the first treatment.

The most important factor overall in choosing a surgical procedure is the specific nature of the patient's particular incontinence problem. Other factors that may play a part in the decision include patient preferences, the doctor's own experience and possible side effects from a procedure. Factors such as other illnesses revealed during the diagnostic investigation may affect the choice of treatment.

Also, any surgical procedure for treating stress urinary incontinence can correct only what is causing the stress incontinence. If another type of incontinence is present as well, such as urge incontinence, the patient may still have urgency symptoms even if the surgery is successful in curing the stress incontinence.

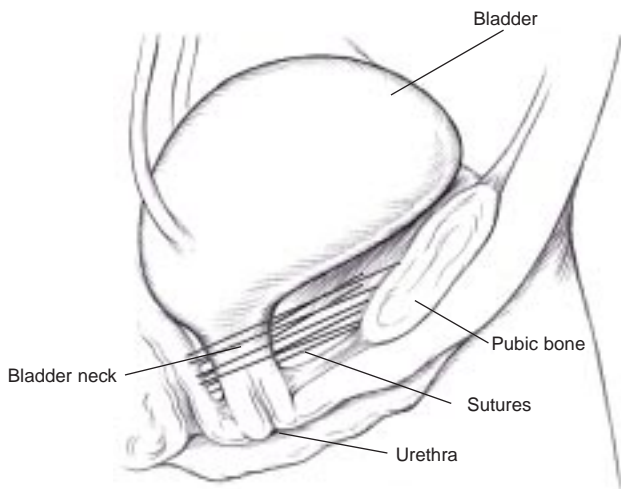


Figure 4a. Supporting sutures in place following retropubic or transvaginal suspension.

Retropubic suspensions

“Retropubic” means behind the pubic bone. The suspensions are performed through an incision in the lower abdomen (see Figure 4b). The surgeon places sutures (surgical stitching material) near the bladder neck and urethra and secures them to a pelvic bone or surrounding supporting structures (see Figure 4a). Retropubic procedures have a long-term success rate of about 84 percent in curing stress incontinence due to urethral hypermobility. “Long term” is defined as more than four years.

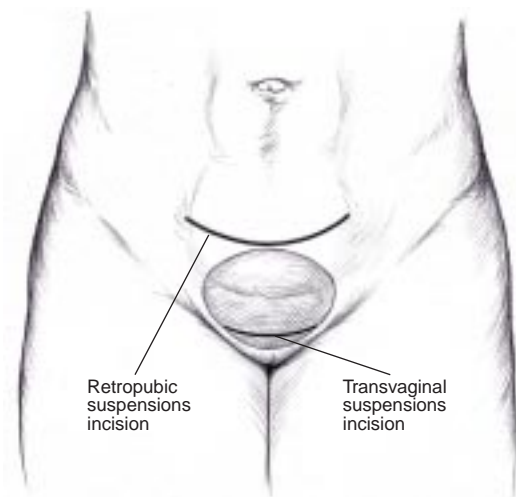


Figure 4b. Approximate location of incisions for female stress incontinence surgery.

Transvaginal suspensions

Transvaginal suspensions are performed through the vagina and through a small incision of about two to three inches in the lower abdomen (see Figure 4b). The surgeon places sutures in the tissue near the bladder neck and urethra from the vaginal side, then transfers the sutures to the abdominal incision, through which they are tied either to the abdominal wall or a pelvic bone (see Figure 4a). For transvaginal suspensions, the long-term cure rate is about 67 percent. The transvaginal approach is often used if, when treating urethral hypermobility, the surgeon also has to repair pelvic organ prolapse.

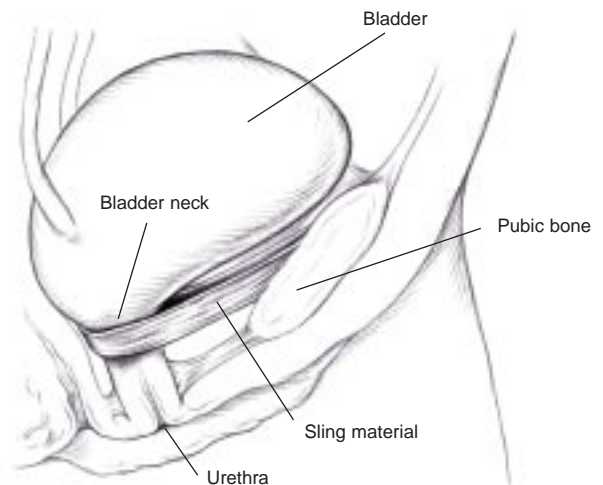


Figure 4c. Sling in place, secured to the pubic bone.

Sling procedures

Sling procedures are performed partly through the vagina and partly through a small abdominal incision similar to the incision for transvaginal procedures. Sling procedures create a hammock-like bolstering of the urethra. A supporting strip of material is placed under the bladder neck and secured to the abdominal wall or a pelvic bone with permanent suture (see Figure 4c). For sling procedures, the long-term cure rate is about 83 percent.

Complications from surgery

Serious complications from surgery for stress incontinence occur very infrequently. Death is extremely rare, and the likelihood of needing a transfusion is less than 5 percent for all procedures.

Some cases have been reported in which women with stress incontinence, but no urge incontinence, develop urge incontinence after surgical treatment for their stress incontinence. Not enough cases have been reported for accurate calculation of how often this complication might occur. However, its occurrence appears to be infrequent.

Less serious complications such as infection occur more frequently, but usually they are easily treated. Most infections that occur can be treated successfully with antibiotics.

Retention, the incomplete emptying of the bladder, is a possible complication. The urine accumulates in the bladder because the patient has trouble urinating. This is temporary in most cases, but may last a month or more.

While the condition lasts, a catheter is inserted through the urethra and into the bladder to drain the urine. The doctor may suggest self-catheterization, in which the patient inserts the catheter and drains her bladder in the privacy of her own home. The procedure is painless, does not require sterile equipment and is easily learned.

The time spent in the hospital after surgery usually ranges from zero to five days, depending on the type of procedure. (Hospital time is generally shortest for transvaginal procedures.) The length of time before resuming normal physical activities after any of these procedures is typically about six weeks.

Where to find more information

National Association for Continence
P.O. Box 8306
Spartanburg, SC 29305
864-579-7900

American Foundation for Urologic Disease
The Bladder Health Council
1128 N. Charles Street
Baltimore, MD 21201
800-242-2383

The Simon Foundation for Continence
P.O. Box 835
Wilmette, IL 60091
800-23-SIMON or 847-864-3913

National Kidney and Urologic Diseases
Information Clearinghouse
3 Information Way
Bethesda, MD 20892-3580
301-654-4415

Questions to ask the doctor

- What are the causes of my incontinence symptoms?
- Do I have other types of incontinence besides stress incontinence? If so, what are my treatment choices for these types of incontinence?
- What surgical procedure do you recommend for my stress incontinence? Why? What are its advantages and disadvantages?
- What are the risks of complications from this surgery? What complications are most likely to occur? How will the complications themselves be treated?
- How much will the surgery cost?
- How many days will I be in the hospital?
- How soon after the operation will I be able to resume my normal activities?

Additional questions to ask the doctor:

- _____

- _____

- _____

- _____

- _____

Glossary

Abdomen: The part of the human body between the chest area and the pelvis.

Anesthesia, local: Loss of sensation only in one part of the body induced by application of an anesthetic agent.

Bladder (urinary): Balloon-shaped pouch of thin, flexible muscle in which urine is temporarily stored before being discharged through the urethra.

Bladder neck: Area of thickened muscle fiber where the bladder joins the urethra.

Catheter: Thin, flexible tube for insertion through the urethra into the bladder, either to introduce fluid or to withdraw urine.

Incision: Surgical cut for entering the body to perform an operation.

Intrinsic sphincteric deficiency (ISD): Defect in the urethral sphincter causing inability to completely seal off the flow of urine.

Kidney: One of two body organs, each about four inches long and two inches wide, that filter out waste products from the blood and discharge these waste products in urine.

Pelvis: Bowl-shaped area formed by the pelvic bones.

Sphincter: A band of muscle fibers that can relax or tighten to open or close a body opening or passage.

Ureter: One of two tubes that carry urine from the kidneys to the bladder.

Urethra (female): A short tube, not quite one and a half inches long, located above the vagina and through which urine flows from the bladder out of the body.

Urethral hypermobility: Brief rotation of the urethra and bladder neck downward into the vagina due to increases in pressure on the bladder from an activity such as coughing.

Urethral sphincter: Muscle fibers around the outside of the urethra that tighten to close off the flow of urine or relax to open the urethra to allow the passage of urine.

Urine: Fluid excreted by the kidneys. About 96 percent of this fluid is water and the rest waste products.

Vagina: Sheath-like enclosed canal extending back to the outer end of the uterus. Sexual intercourse, the outflow of blood during menstruation and the birth of a baby all take place through the vagina.

This publication is intended for patients and lay readers. The information is summarized from the *Report on the Surgical Management of Female Stress Urinary Incontinence*, developed by the American Urological Association, Inc., and its Female Stress Urinary Incontinence Guidelines Panel.

A Doctor's Guide for Patients is intended to stimulate and facilitate discussion between the patient's family and her doctor regarding the types of treatment described in a summary fashion in this booklet. The full *Report* of the guidelines panel provides the physician with a more detailed discussion of treatment guidelines and options to be considered.

For additional copies, physicians may contact:

American Urological Association, Inc.
Health Policy Department
1120 N. Charles Street
Baltimore, MD 21201
Phone: 410-223-4367
Website: <http://www.auanet.org>

Copyright © 1997. American Urological Association, Inc.