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CME CREDIT HOURS

Evaluation and medical management of female urinary incontinence

KEY POINTS:

Urinary incontinence is common, and too often ignored. For most women, an office evaluation and behavioral and medical therapies can help.

In the evaluation, the primary care physician should try to distinguish the type of incontinence: transient, stress, urge, overflow, mixed, or total.

Estrogen replacement therapy is now recommended for women with any type of incontinence.

Urologic consultation is reserved for women with recent urologic or gynecologic procedures, recurrent urinary tract infections, anatomic abnormalities, suspected obstruction causing urinary retention, hematuria, or difficult management problems.

ABSTRACT: Urinary incontinence should not be accepted as inevitable, and is not solely the province of urologic specialists. A thorough history and physical examination, performed by the primary care physician, is the cornerstone of evaluation. Most cases respond to behavioral and medical therapy.

Primary care physicians can and should take an active role in evaluating and managing urinary incontinence in women, according to guidelines from the Agency for Health Care Policy and Research.[1] This common, embarrassing, and costly problem severely impairs the patient's quality of life, but is too often ignored or concealed. Most patients do not need a urological consultation or surgery, and can benefit from simple behavioral or medical treatments.

This article outlines a practical approach to diagnosing, evaluating, and medically managing female urinary incontinence.

INCONTINENCE IS COMMON AND COSTLY

The prevalence of urinary incontinence—involuntary loss of urine through the urethral meatus, of sufficient magnitude to constitute a problem—ranges from 10% to 30% in young adults and 15% to 35% in persons older than 65 years,[2] and is twice as common in women as in men. It is a leading cause of institutionalization,[2,3] and costs an estimated $16 billion per year to manage.[4] Yet, evaluating and treating this problem instead of ignoring it actually saves money in the long run and greatly enhances the patient's quality of life.

TYPES OF URINARY INCONTINENCE

Urinary incontinence should not be considered a disease but rather a sign of an underlying problem. One must distinguish the type to select the proper treatment. In many cases, especially in the elderly, the

TABLE 1

CAUSES OF TRANSIENT URINARY INCONTINENCE

- Delirium or confusion
- Infections
- Atrophic vaginitis or urethritis
- Drug side effects
- Psychological disorders
- Excessive urine output (congestive heart failure, hyperglycemia)
- Restricted mobility
- Stool impaction

underlying problem is multifactorial and requires urologic evaluation and periodic reassessment.

Transient (reversible) incontinence. The acute onset of transient incontinence, which is common in elderly and hospitalized patients, can result from numerous causes, or a combination of them (**TABLE 1**).[5]

Stress incontinence occurs when an increase in abdominal pressure (eg, Valsalva maneuver) places "stress" on the bladder and its support mechanisms. This is the most common type of incontinence in women of all ages, except for the frail and elderly. Anterior vaginal-wall relaxation (which allows hypermobility of the bladder neck and urethra) accounts for 85% of cases of stress incontinence, and develops most commonly with aging, hormonal changes, traumatic or prolonged childbirth, or pelvic surgery. The other 15% of cases, occurring in patients with a well-supported bladder neck and urethra, are caused by intrinsic sphincteric deficiency, which may be due to damage to the bladder neck during pelvic or anti-incontinence surgery, pelvic radiation, trauma, or neurogenic disorders resulting in bladder neck denervation.

One must distinguish the type of incontinence to select the proper treatment

Urge incontinence—an abrupt desire to void (urgency) that cannot be suppressed or inhibited ("unstable bladder")—is usually idiopathic and affects the elderly more than other age groups. However, causes such as bacterial cystitis, bladder tumors, bladder stones, outlet obstruction, or neurologic disease can and must be excluded.

Overflow incontinence reflects overdistention of the bladder. Patients have frequent or constant dribbling of urine without a normal voiding pattern. This pattern may result from bladder-outlet obstruction (due to stricture or overcorrective surgery for incontinence or vaginal prolapse), an acontractile detrusor (due to diabetes, multiple sclerosis), or psychogenic retention.

Mixed incontinence. From 50% to 60% of patients presenting for evaluation of stress incontinence also have urge incontinence. While other combinations of incontinence are possible, proper management of mixed incontinence requires recognizing and evaluating each anatomic and neurologic component.

Total incontinence is continuous urine leakage unrelated to activity, without a sensation of bladder fullness or the urge to void. Such patients may have severe intrinsic sphincteric deficiency, urinary tract fistulas, congenital anomalies, or overflow incontinence.

EVALUATION

The general evaluation should include the history, a diary of fluid intake and voiding, a physical examination, a urinalysis, a urine culture, and a measurement of postvoiding residual urine volume.

Taking a thorough history

The history should elucidate the problem's onset, duration, evolution, progression, inciting events (eg, Valsalva maneuver, change of position or environment, temporal relations), and how the patient has tried to control it (eg, limiting fluid intake, timed voiding, changing the medication schedule, pelvic-floor exercises). How many pads does the patient use per day, and what type? How does the problem affect her daily activities and quality of life?

Have the patient keep a diary, if she can, recording the quantity and type of fluids consumed, the times she voids normally, the volume voided, leakage events, and the number of pads used per day. The diary gives useful information about the circumstances under which leakage occurs, the severity of incontinence, the functional bladder capacity, and the clinical utility of therapy.

Identify environmental factors that can impede some patients from getting to the toilet, a particular problem in elderly patients with urge incontinence.

Establish the pattern of voiding. In further questions, ask about the urge to urinate,

frequency of urination, nocturia, obstruction (low flow or double voiding), hematuria, infections, type and amounts fluids consumed (alcohol, caffeinated products), dietary fiber, hormonal status, and childhood voiding patterns. Pelvic-floor function can also be assessed by questions about prolapse, sexual function, dyspareunia, constipation, fecal impaction, or fecal incontinence.

Ask about the surgical history, specifically, any operations for incontinence, pelvic prolapse, or any genitourinary problems. Has she had any injuries that might have affected urinary tract function? What is her obstetric history (parity, types of delivery, difficult labors, perineal repairs, and peripartum voiding function)?

Establish the medical history. Does the patient have any conditions that can interfere with urinary output (eg, renal insufficiency, diabetes, congestive heart failure) or bladder control (eg, multiple sclerosis, Parkinson's disease, cerebral vascular accidents)? Radiation therapy and other forms of cancer treatment can cause overlooked damage to pelvic structures and function.

Review all medications for potential side effects on the genitourinary system. Numerous over-the-counter and prescribed drugs affect the innervation and muscle function of the bladder and sphincter; these include antihypertensives, diuretics, sedatives, hypnotics, analgesics, gastric motility promoters, and antidepressants.

PHYSICAL EXAMINATION FOR INCONTINENCE

All patients with voiding dysfunction or incontinence should undergo a complete physical examination, with special emphasis on the abdomen, genitals, pelvis, and nervous system.

Abdomen

Look for surgical scars, trauma, and obesity. Palpation usually reveals any large abdominal or retroperitoneal masses or bladder distention, if present.

Genitals

For a complete examination, examine the genitals in four successive steps.

General appearance. Inspect for external genital abnormalities (Bartholin's cysts, scars, condylomas, adhesions), overall appearance of the perineum and the introital opening (pelvic floor laxity), discharge (from infection), and atrophy of the vaginal epithelium (loss of rugae; shiny, thin vaginal wall).

Urethra. Inspect for periurethral and urethral lesions (mucosal prolapse, caruncles, condylomas, Skene's abscesses, or stenosis). Palpate for scarring, fibrosis, or tenderness, which suggest urethritis or a urethral diverticulum.

The "Q-tip test" is a simple way to check for urethral hypermobility. With the patient in the lithotomy position, place a lubricated, sterile cotton-tipped swab in the urethra to the level of the bladder neck and ask the patient to cough and strain; deflection of the Q-tip more than 30° is generally considered abnormal.

The postvoiding residual urine volume can be measured by straight catheterization or bladder ultrasonography. Urine obtained by catheterization can be sent for screening or culture, but catheterized samples for culture (no screens) are indicated in cases of persistent urge incontinence or difficult cases of recurrent urinary tract infections of unclear etiology. (Vaginal swabs for culturing *Ureaplasma*, *Chlamydia*, and *Mycoplasma* are often needed for the complete evaluation of complex voiding dysfunction.)

Provocation test. We usually measure the postvoiding residual urine volume with a straight catheter, and then, with the catheter still in place, perform a provocation test, filling the bladder with 200 to 300 cc of sterile water, withdrawing the catheter, and asking the patient to cough and strain in various positions (supine, sitting, or standing). Discrete, isolated leakage events indicate stress urinary incontinence; leakage with little provocation in the supine position, in the absence of a hypermobile urethra based on the Q-tip test, suggests intrinsic sphincteric deficiency. An unstable bladder (urge incontinence) is evident if the Valsalva maneuver precipitates leakage and the patient cannot restrain further urine flow or bladder emptying.

Over-the-counter and prescribed drugs may compromise bladder and sphincter innervation and muscle function

After filling the bladder, we ask some patients also to contract the pelvic-floor muscles before abdominal straining, standing, or coughing, to determine whether they may benefit from pelvic-floor exercises. Patients who have less observable leakage (place a piece of tissue paper in front on the urethra) after this simple test are probably good candidates for a pelvic-floor exercise program, as they demonstrate functional innervation of the pelvic floor muscles.

TABLE 2

CRITERIA FOR UROLOGIC REFERRAL

- Recent urologic or gynecologic procedure
- Recurrent symptomatic urinary tract infection
- Anatomic abnormality
  - Cystocele
  - Rectocele
  - Uterine prolapse
- Suspected obstruction
  - Straining to void
  - Postvoiding residual urine volume > 100 cc
- Urinary retention
- Hematuria
- Difficult management problems
  - Consideration of permanent catheter

Prolapse. Inspect the anterior, posterior, and apical aspects of the vaginal vault with a posterior blade of a Grave's speculum, and palpate these areas while asking the patient to rest and strain her pelvic-floor muscles. This is a good time to help the patient identify the proper muscle groups to contract in pelvic-floor exercises. The various components of prolapse such as a cystocele, rectocele, enterocele, or uterine prolapse should be evident with a systematic and proper examination (**FIGURE**).

A urologist can often make beneficial recommendations with minimal testing

The neurologic examination

The neurologic examination focuses on the patient's general status, perineum, and lower extremities.

Note any loss of cognitive function, tremors, weakness, or gait abnormalities, which reflect the general neurologic status. On examination of the back, asymmetry of bone contours, skin dimples, scarring, or hair tufts suggest spinal dysraphism or tethered cord syndrome.

In the perineal examination, evaluate the S2–S4 nerve roots by testing the integrity of the external anal sphincter and touch sensation of the perineum. The bulbocavernosus reflex (contraction of the external anal sphincter when sensation is applied to the clitoris) is present in 70% to 80% of neurologically normal women; its absence may be meaningful in conjunction with other neurologic findings.

In the lower-extremity evaluation, test for loss of sensation and check the deep tendon and primitive reflexes. A stocking pattern of sensory loss may indicate metabolic neuropathies such as diabetes or alcoholism. The Babinski sign (a primitive reflex) and ankle clonus suggest suprasacral cord lesions. Deep tendon reflexes of the quadriceps (L4) and Achilles tendon (S1) demonstrate normal segmental and suprasegmental spinal cord function.

Initial laboratory tests

Urinalysis excludes hematuria, pyuria, bacteriuria, glycosuria, and proteinuria.

A urine culture is obtained to look for bacteriuria or pyuria. As mentioned above, urine cultures from straight catheterization and vaginal cultures for atypical bacteria may be indicated.

Urine cytology and newer diagnostic tests for basement membrane antigens of the bladder are indicated to screen for bladder cancer if there is hematuria without infection (ie, without pyuria and bacteriuria).

Blood urea nitrogen (BUN) and serum creatinine determinations are indicated in patients with severe voiding dysfunction; an abnormally low BUN level may reflect excess fluid consumption.

WHAT DOES A UROLOGIST DO?

Several types of patients should be referred for urologic evaluation (**TABLE 2**). These include patients with a history or physical findings suggestive of underlying urologic disease, prolapse, hematuria, or recurrent infection, or who recently underwent abdominal or pelvic surgery. A urologist often can make beneficial recommendations with minimal testing, especially in young and old patients with multifactorial urinary incontinence. However, urologists can use several specialized tests in difficult cases.

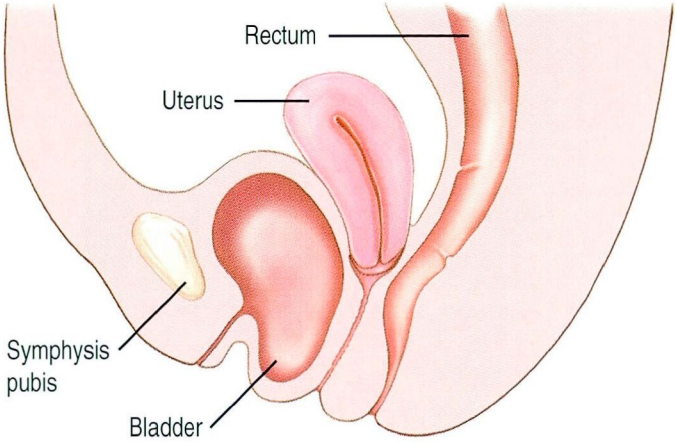
Urodynamic testing

The dynamic interaction of the bladder muscle and sphincters can be evaluated at different levels of sophistication and complexity, but such testing is not required for simple stress incontinence in a woman who has not had previous surgery. Although urodynamic testing

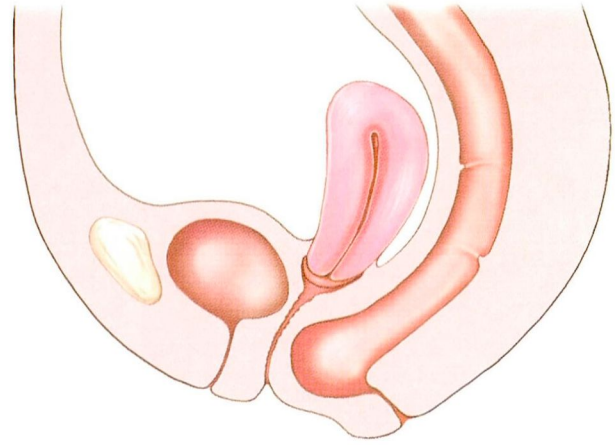
FIGURE

PROLAPSE

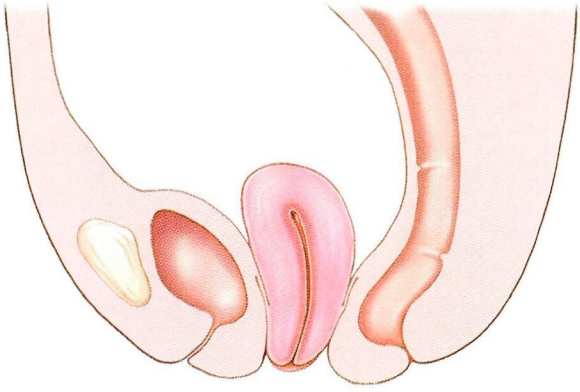
Loss of pelvic support, usually due to childbearing, allows the vagina, uterus, and their adjacent organs to descend below their normal positions. Displacement of the bladder predisposes to stress incontinence, but a large cystocele can also cause urinary retention by placing pressure on the bladder neck. The physician should be able to detect any of the components of a prolapse by asking the patient to bear down during the vaginal examination.



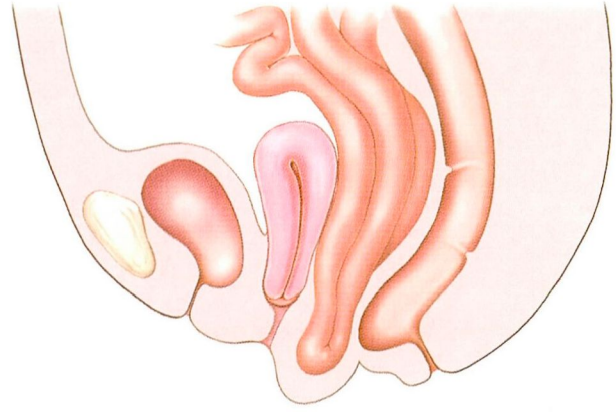
Cystocele. Descent of the lower portion of the anterior wall of the vagina allows the bladder to descend as well. This condition is commonly associated with stress incontinence. Use a speculum blade to retract the posterior vaginal wall to inspect for this condition.



Rectocele. When the rectovaginal fascia no longer restrains the rectum in its normal position, the rectal wall protrudes into the vagina. Patients may complain of constipation because of trapped stool. Retract the anterior vaginal wall to inspect for this condition.



Uterine prolapse. The cervix is normally located in the upper third of the vagina. It may descend as far as the hymenal ring in multiparous women without causing symptoms, but any further descent is probably clinically significant.



Enterocele. Presence of a portion of the bowel in a protrusion of the cul de sac or pouch of Douglas distinguishes an enterocele from a rectocele. The examiner places an index finger in the rectum and a thumb in the vagina to palpate the bowel between them.

helps confirm the clinical diagnosis of stress incontinence, its primary role is to identify other factors (bladder compliance, unstable bladder contractions, voiding bladder pressures) that may influence the overall management.

In increasing order of complexity, the following urodynamic tests are available:

Simple cystometrography (see "Provocation test," above).

Single-channel cystometrography uses a single catheter in the bladder to measure pressure during filling, which reflects bladder compliance.

Multichannel cystometrography typically measures the urine flow rate, bladder pressure, and rectal pressure (ie, intra-abdominal pressure). This test is indicated for patients with mixed incontinence or for whom anti-incontinence procedures have failed. It tests bladder compliance and instability, dynamic intrinsic sphincteric competency (by determining the Valsalva pressure needed to cause urinary leakage), and bladder pressure during voiding.

Sophisticated testing is not required in a woman with simple stress incontinence and no previous surgery

Videourodynamics—a combination of fluoroscopy and multichannel cystometrography—simultaneously assesses anatomy and function of the bladder.

Ambulatory monitoring of bladder pressure and voiding is generally restricted to research and difficult cases of refractory detrusor instability.

Electromyography measures the electrical activity of either the external urethral sphincter or the anal sphincter to document denervation of the pelvic floor or urinary sphincter, or abnormal coordination of the bladder and external urinary sphincter. It is mainly used in patients with abnormal neurologic findings (multiple sclerosis and spinal cord disease, injury, or surgery).

The urethral pressure profile consists of static measurement of the pressure along the length of the urethra. This test has very little value in determining the dynamic cause and type of female urinary incontinence.

The abdominal leak-point pressure is measured as the patient performs a slow Valsalva maneuver while in the upright position, to determine the level of abdominal pressure that allows urine to escape. This is an important dynamic test in women with stress incontinence.

Cystoscopy

Cystoscopy has a limited role in patients with straightforward, isolated stress urinary incontinence. However, it is needed to evaluate other causes of urinary incontinence or concurrent urologic diseases identified in the history and physical examination, especially in patients with urge incontinence. Examination of the urethra may reveal a diverticulum, fistula, stricture, or urethritis. The bladder is inspected for mucosal or trigonal abnormalities, trabeculation, foreign bodies, and stones. Bladder-neck hypermobility and intrinsic sphincteric deficiency can be reassessed by having the patient cough or strain with the scope in the midurethra.

Urinary tract imaging

Urinary tract imaging has a very limited role in uncomplicated female incontinence. Intravenous pyelography, voiding cystourethrography, and ultrasonography are commonly used for evaluating the upper and lower urinary tract, but are never first-line studies.

Intravenous pyelography is indicated if the history suggests an ectopic ureter, if the patient has hematuria or recurrent urinary tract infections, or if ultrasonography or computed tomography reveal hydroureteronephrosis.

Ultrasonography is useful for evaluating the upper urinary tract, particularly to detect hydronephrosis due to elevated bladder pressure in patients with neurogenic bladder-sphincteric dysfunction. Other uses are to measure postvoiding residual volume and to detect urethral diverticula.

Voiding cystourethrography is a simple, safe, and reliable study to evaluate the integrity of the female lower urinary tract when one suspects bladder or urethral abnormalities such as vesicovaginal or urethrovaginal fistulas, urethral diverticula, or bladder prolapse. Although resting and straining views may

reveal urethral hypermobility, voiding cystourethrography has a limited role in establishing conclusive evidence of intrinsic sphincteric deficiency because it does not simultaneously determine bladder contractions that may also result in the open appearance of the bladder neck.

MANAGING URINARY INCONTINENCE

After transient or acute causes of incontinence have been identified and treated, the three major categories of therapy for female urinary incontinence are behavioral, pharmacologic, and surgical. Patients should be informed of all the treatment options and the expected outcomes, risks, and benefits of each (**TABLE 3**).[5] The least invasive treatments are usually offered first (behavior modification, pelvic-floor retraining), then pharmacologic agents if indicated and tolerated, and finally, reconstructive surgery.

BEHAVIORAL INTERVENTIONS: FIRST-LINE THERAPY

Behavioral interventions are easy to initiate; the type depends on the type of voiding dysfunction.

Simple measures often help

For many patients, simple, common-sense measures can decrease the amount of incontinence.

- Help the patient become aware of the amount and timing of fluid intake, and encourage her to avoid bladder stimulants such as caffeine.
- Do not give diuretics before bedtime.
- Put the patient on a timed-voiding schedule, to empty the bladder before it fills to its maximum functional capacity.

In patients with congestive heart failure or fluid retention in the lower extremity:

- Elevate the legs when sitting to promote diuresis before periods of recumbency.
- Ambulate to promote muscle pumping of congested veins in the leg.
- Prescribe pressure-gradient stockings.
- Use diuretics (judiciously).
- Reduce salt intake.

In patients with urge incontinence and cognitive dysfunction, mobility problems, or physical handicaps:

- Make the toilet easier to get to and use by installing support bars and better lighting.
- Suggest use of a bedside commode.
- Alter garments for easier undressing.
- Provide mobility aids.

TABLE 3

OUTCOMES OF TREATMENT FOR URINARY INCONTINENCE

Treatment	% of patients	
	Cured	Improved
Behavioral	12–16	54–95
Pharmacologic	44	77
Surgical	78–92	—

Outcomes vary according to type of incontinence and specific therapy used. Source: Agency for Health Care Policy and Research, reference 1

Bladder retraining

Bladder retraining teaches the patient to inhibit urinary urgency and gradually increase the interval between voiding. Using sympathetic mediated negative feedback inhibition of a bladder contraction, which is augmented by the somatic mediated contraction of the external urinary sphincter (voluntary contraction of the external urinary sphincter), most patients can extinguish low-level bladder contractions (urgency). Strengthening the voluntary sphincter of voiding will help extinguish or prevent urinary leakage from involuntary bladder contractions. Increasing external urinary sphincter tone with a voluntary effort can decrease urge incontinence, lead to less urinary frequency, and improve functional bladder capacity.

Other methods to inhibit the urge sensation include distraction techniques and biofeedback techniques that employ deep breathing and relaxation exercises. All these techniques appear to work best in patients who have urge or mixed incontinence and who are cognitively intact, properly motivated, and able to understand and follow instructions. In fact, these select patients are some of the few who actually can be cured of incontinence by behavioral intervention alone.

Pelvic-floor exercises are an acceptable first-line therapy, except in patients with intrinsic sphincteric deficiency

Pelvic-floor muscle rehabilitation

Exercising the levator ani muscles can decrease urethral hypermobility, increase urethral resistance, and prevent stress incontinence. A single instruction session during an office visit is sufficient for many patients to learn to perform the muscle contractions correctly. The best results are obtained through repetitive training sessions, biofeedback, and consultation or initiation of therapy by a physical therapist or nurse with specialized training.

Devices sometimes prescribed for pelvic-floor muscle rehabilitation are weighted intravaginal cones for exercise, and rectal or vaginal electrodes to stimulate the pelvic

muscles. Although the side effects of the latter are minimal, the results appear to last only as long as the device is used, and may show no advantage over properly performed exercises.

We strongly emphasize the rehabilitation of not only the levator ani muscles (especially the pubococcygeus muscle, which has fibers inserting around the urethra and bladder neck) but also of the obturator internus muscle, which shares a common fascial insertion with the levator ani muscles, called the arcus tendinous muscularis.

Although pelvic-floor rehabilitation may appear useful for all patients, stress urinary incontinence may result from traumatic peripheral neuropathy, with resultant muscle atrophy and dysfunction. Therefore, standard rehabilitation techniques require at least partial innervation to the muscle groups of interest, unless the nerves are bypassed by an electrical stimulator.

Currently, there is no reproducible neurologic test to determine which patients are likely to benefit from a standard approach, and it is expensive because it requires multiple, labor-intensive office visits. Yet, the low risk of this noninvasive therapy makes pelvic-floor exercises an acceptable first-line therapy, except in patients with intrinsic sphincteric deficiency.

Surgery is considered only if pelvic-floor exercises, timed voiding, and pharmacologic therapy fail

DRUGS SUPPLEMENT BEHAVIORAL INTERVENTIONS

Although drug therapy tailored to the symptoms and diagnostic findings has been used with variable success, it works best when used as an adjuvant to behavioral interventions.

Drug therapy for urinary incontinence is generally used to inhibit bladder smooth-muscle contractions in urge incontinence, increase bladder outlet resistance in stress incontinence, decrease outlet resistance and increase bladder smooth muscle contractions in overflow incontinence, or combinations of these approaches.

Anticholinergic drugs for urge incontinence

Anticholinergic drugs inhibit bladder contractions, which are mediated primarily by the parasympathetic nervous system. All anticholinergics are contraindicated in patients with documented narrow-angle glaucoma.

Oxybutynin and dicyclomine have anticholinergic and direct relaxant effects on the smooth muscle of the bladder. Relaxation of the bladder muscle increases the volume necessary to stimulate bladder contraction, increases total bladder capacity, and decreases the strength of normal bladder contraction.

For patients with urge incontinence caused by bladder instability, either of these two agents may relieve symptoms at least partially. In general, patients with smaller bladder capacities respond well to oxybutynin, whereas patients with large bladders respond better to dicyclomine.

The recommended dosage of oxybutynin is 2.5 to 5.0 mg by mouth two to four times a day; the recommended dosage of dicyclomine is 10 to 20 mg one to four times a day.

Side effects and toxicities include dry mouth, blurred vision, constipation, elevated intraocular pressure, cardiac disturbances, and delirium.

Imipramine, a tricyclic antidepressant, has a dual action on the lower urinary tract: as an anticholinergic it decreases bladder contractions, and as an alpha agonist it increases bladder-neck resistance. Although approved by the Food and Drug Administration for the treatment of depression and for enuresis only in children, the usual adult dosage is 10 to 25 mg once to three times daily. Side effects may include postural hypotension and cardiac conduction disturbances in the elderly.

Hyoscyamine and hyoscyamine sulfate are similar to other anticholinergic agents but in general appear to have a less-potent effect but fewer side effects. The adult dosage of hyoscyamine ranges from 0.15 to 0.3 mg once a day to four times a day; the hyoscyamine sulfate dosage is 0.375 mg one to two times a day.

Propantheline, an antimuscarinic and ganglionic-blocking agent, is less popular for treating urge incontinence. The recommended adult dosage is 15 to 30 mg every 4 to 6 hours; the side effects are similar to those of oxybutynin.

Sympathomimetics for stress incontinence

Because the intrinsic sphincter and bladder neck are under sympathetic control, cases of mild stress or overflow incontinence have responded to sympathomimetics and alpha adrenergic agents.

Pseudoephedrine and phenylpropanolamine, components in commonly used over-the-counter decongestants, are the most commonly used agents for stress incontinence. The usual adult dosage of phenylpropanolamine is 25 to 100 mg in sustained-release form, given orally twice a day; that of pseudoephedrine is 15 to 30 mg three times a day.

Side effects include high blood pressure, stomach cramping, and central nervous system symptoms of excitation and drowsiness. These drugs must be used with caution in patients with hypertension, angina, hyperthyroidism, diabetes, and stress incontinence during aerobic exercise.

Alpha adrenergic blocking agents for overflow incontinence

Doxazosin and terazosin reduce outlet resistance to urine flow and have synergistic effects with estrogen therapy. Side effects include dizziness, vertigo, fatigue, and—rarely—hypotension. The dosage of doxazosin is 1 to 4 mg at bedtime.

Cholinergic drugs for hypocontractility

The most difficult cases of urge incontinence are in patients with bladder hypocontractility and moderate-to-large postvoiding residual volume or with bladder hypocontractility alone.

Bethanechol is used to treat bladder underactivity, but its contraindications (asthma, bradycardia, Parkinson's disease) and side effects (sweating, excessive salivation) preclude its use as a first-line therapy.

Estrogen therapy for all

Estrogen therapy has recently been shown to be a beneficial adjuvant to all types of therapy for all forms of incontinence—even overflow incontinence caused by urethral obstruction by scarring, fibrosis, or stenosis (in which it helps restore the mucosal, vascular, and muscular integrity of the urethra and thus decrease impedance to urine flow). By promoting up-regulation of neurotransmitter receptor function, estrogen therapy may augment the effect of anticholinergics and alpha adrenergic receptor agents. It can be used with behavioral interventions and with other drugs. In fact, it is recommended as baseline therapy for all forms of incontinence.

Estrogen replacement therapy for incontinence can be given orally, transdermally, or topically.[6] At the very least, topical estrogen application should be considered, because of its low systemic absorption and preferential local uptake; in some cases, we recommend topical therapy in addition to oral or transdermal supplementation when urogenital atrophy is noted on pelvic examination.

Systemic side effects or minor contraindications such as liver disease, cholelithiasis, seizures, uterine fibroids, and migraine headaches are usually not a concern with topical estrogen therapy once the vaginal mucosa integrity is restored. The inclusive but controversial risk of inducing breast and endometrial cancer warrants the performance of Papanicolaou smears and breast examinations at the beginning of local estrogen therapy and yearly thereafter. Major contraindications to estrogen therapy include undiagnosed genital bleeding, pregnancy, uterine cancer that has not been cured with surgical treatment, and the very rare conditions of metastasizing leiomyomata and lymphangioleiomatosis.

Conjugated equine estrogens (Premarin) and micronized estradiol (Estrace) are available as vaginal creams. The dosage is 2 g applied daily for 2 weeks, then 1 g one to three times per week.

In the long run, surgery may be the cheapest option

WHEN IS SURGERY INDICATED?

Reconstructive surgery should be considered only for patients in whom acceptable continence has not been achieved with nonsurgical management and who have done all they can to rehabilitate the pelvic floor and voiding function with behavioral and pharmacologic therapy.

Cost-effectiveness: Doing nothing costs more

Nevertheless, surgery should not be ruled out on the basis of cost. In fact, in the long run, surgery may be the cheapest option. A recent report revealed that, in 1994 dollars, untreated chronic stress incontinence in an elderly patient cost $86 726 over 10 years, compared with $25 388 for bladder-neck suspension surgery, $62 021 for pharmacologic therapy, or $68 924 for behavioral therapy.[7]

Continued advances in prevention and evaluation, and optimization of the pelvic floor and bladder function should, in the long run, reduce the overall cost of urinary incontinence. ■

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