

# Evaluation and Nonsurgical Management of Lower Urinary Tract Symptoms, Part 1

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**As our population ages, the prevalence of pelvic floor dysfunction continues to rise. While many surgical procedures are advocated to correct various anatomic defects, nonsurgical interventions are also available to address these common disorders. A combination of medication, physical therapy, and bladder retraining techniques may be useful in optimizing patient treatment.**

**P**elvic floor dysfunction (PFD) refers to a broad range of structural and/or functional defects involving the pelvic organs, musculature, and connective tissue. Although the symptoms and underlying abnormalities are unique to each patient, PFDs can be broadly classified into 5 categories: lower urinary tract symptoms (LUTS), defecatory dysfunction, pelvic pain disorders, pelvic organ prolapse, and sexual dysfunction.

This first article of a series will discuss the office evaluation and nonsurgical management of LUTS.

LUTS are categorized as either an inability to appropriately store urine or an inability to evacuate urine. Storage problems may result in frequency, urgency, or incontinence that are most commonly due to an uninhibited bladder contraction (urge urinary incontinence [UUI]), urethral sphincteric incontinence (stress incontinence [SUI]), or a combination of both (mixed incontinence [MUI]). Evacuation disorders result when the bladder loses its ability to effectively empty. This can result in partial or complete

retention, urinary hesitancy, and significant straining to void.

Although practices may vary to some extent, clinical diagnosis of these disorders can usually be accomplished with a thorough history and physical exam, as well as some simple office studies. Ideally, all patients with LUTS should complete a bladder diary in order to elicit the nature of voiding patterns, which can then be collaborated with subjective complaints.

A thorough history of other medical issues or medications that may be contributing to the problem is also necessary. Validated questionnaires can be used to gauge the subjective severity of symptoms; they include, but are not limited to, the Incontinence Impact Questionnaire, the Pelvic Floor Distress Inventory, and the Pelvic Floor Impact Questionnaire.

## URINARY INCONTINENCE

Approximately 95% of neurologically intact females who complain of urinary incontinence will have either SUI, a detrusor compliance abnormality (ie, UUI), or a combination of both.

A simple office cystometrogram (CMG) may be used to characterize storage and evacuation disorders. The patient is asked to present to the office with a subjectively full bladder, then void into a measured

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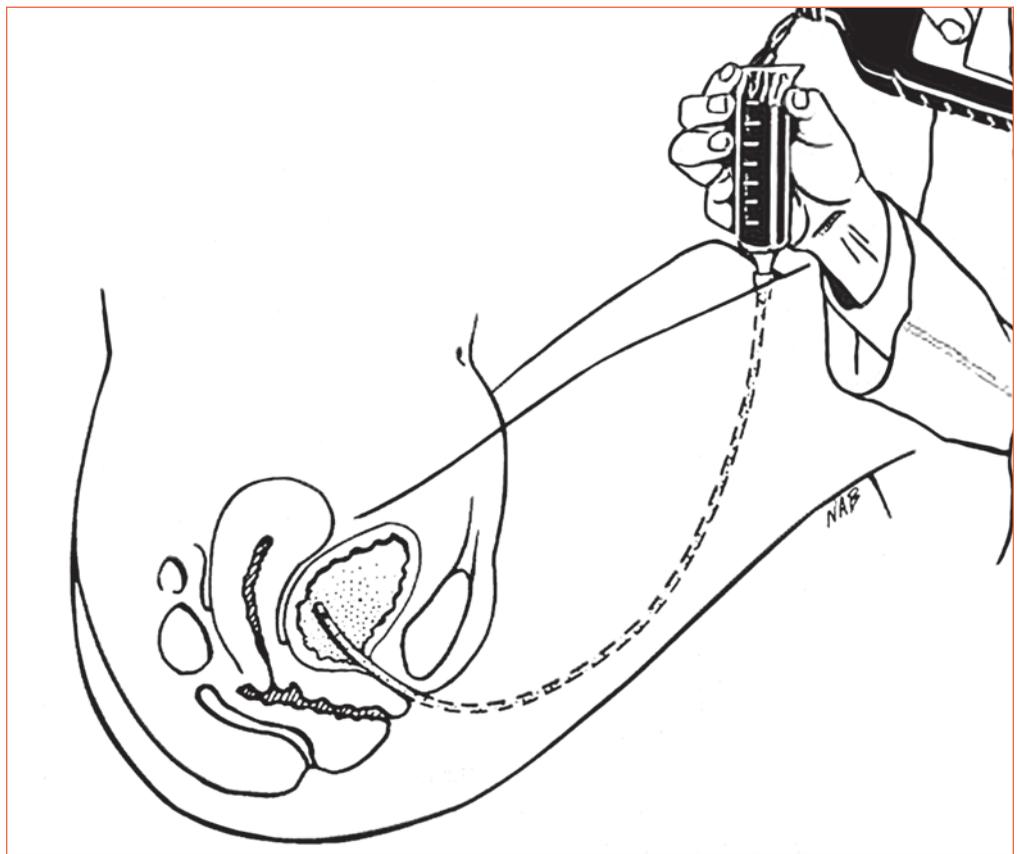
urine collection device (Texas hat). A post-void residual is then obtained via catheter. The bladder is back-filled via catheter and 50-cc syringe, and the patient is instructed to inform the clinician of her first sense of bladder fullness and full bladder capacity (Figure 1).

The patient is then subjected to provocative measures, such as forced coughing both supine and standing, bouncing on the heels, and listening to running water, to elicit SUI or uninhibited bladder contractions. Although the sign of SUI can usually be objectively demonstrated in patients with an incompetent urethral sphincter, uninhibited bladder contractions are not always reproduced on simple or multichannel CMG. Strong urge to void may be elicited at lower bladder capacity for patients with complaints of urgency, and in some cases,

an uninhibited bladder contraction may occur during filling. This is observed when the column of fluid in the syringe rises with the bladder contraction.

Although the absence of a detrusor contraction is not an indication that the patient does not have an overactive bladder (OAB), the inability to reproduce the sign of stress incontinence at maximum capacity with provocative maneuvers in the standing position usually excludes the presence of stress incontinence.

If a large prolapse is present, a reduction maneuver should be performed, with the goal of mimicking the outcome of a prolapse repair in order to determine if the patient has occult, or potential, stress incontinence. Reduction maneuvers can be accomplished with a bivalve speculum, a pessary, scopettes, or a form of vaginal packing. In



**FIGURE 1.** Simple office “eyeball” cystometrics.  
 Source: Walters M, Karram M. *Urogynecology and Reconstructive Pelvic Surgery*. Third Edition. Philadelphia, PA: Elsevier Health Sciences. Used with permission.

summary, this simple “bedside CMG” can rule out high postvoid residual, estimate bladder capacity, diagnose the sign of SUI in most cases, and pick up some cases of detrusor overactivity.

Urodynamic SUI is defined as urinary leakage that coincides with an increase in intra-abdominal pressure (eg, sneeze, cough, or exercise) in the absence of a detrusor contraction. Because the most common intrinsic cause of SUI is an anatomic defect leading to hypermobility of the urethra, women seeking definitive treatment for SUI are often managed surgically via midurethral sling (either retropubic or transobturator approach). It is important, however, to recognize nonsurgical therapies for select patients.

Several lifestyle modifications can be employed to lessen SUI, UUI, and MUI symptoms. Healthy bladder habits such as minimizing bladder irritants, avoiding diuretics,

and limiting oral fluid intake can improve both stress and urge incontinence symptoms.

Timed voiding techniques can also slowly improve bladder compliance and retrain the bladder to resist nonurgent voiding. This is accomplished by instructing the patient to time her voids over a certain interval and then expand that interval every week by 15 minutes. Limiting oral fluid intake during periods of the day when urgency and frequency are more bothersome is also an appropriate strategy for minimizing symptoms.

There are some marketed barrier devices for SUI (Figure 2). Several pessaries utilize an incontinence knob to minimize urethral hypermobility. Depending on the patient presentation, incontinence dishes and rings, with and without support, can be customized for the individual patient.<sup>1</sup> If a patient does not desire to use a pessary, other sim-

**FOCUSPOINT**

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**FIGURE 2.** Examples of incontinence pessaries. Courtesy of CooperSurgical.

ple barrier modifications such as a tampon in the vagina may also provide some symptomatic relief. Thyssen et al described 63 women with SUI who wore a simulated tampon device for 5 weeks: 30 (48%) were subjectively continent, and 22 (36%) reported an improvement in continence symptoms.<sup>2</sup>

OAB is defined as a syndrome of symptomatic urgency and frequency of urination (>8 voids per day and/or >3 voids at night) which may or may not be accompanied by episodes of incontinence due to uninhibited detrusor contractions (dry vs wet OAB). The prevalence of OAB increases with age and occurs in equal percentages of men and women in the population (~16%).<sup>3</sup> Treatments for OAB favor medication such as antimuscarinics (Table), in addition to pelvic floor physical therapy (PT) and bladder retraining techniques.

Prior to initiation of antimuscarinics, other sources of increased urinary urgency should be ruled out, including pelvic masses, urinary tract infection, diuretic use, and polynocturia due to lower extremity edema.<sup>4</sup> Primary nocturia must be distinguished from OAB, as frequent nighttime urination can be due to vascular insufficiency that leads to increased fluid mobilization while supine, which is treated with daytime diuretics, fluid restriction, and devices such as compression stockings. Voiding greater than 40% of the total 24-hour volume is an indicator that this may be the source of nocturia. Conversely, frequency at nighttime

and low volume voids may be treated with behavioral modification, antimuscarinics, and also tricyclic antidepressants such as amitriptyline or imipramine at night.

The mechanism of action of the medications in the Table is of antagonism at M2 and M3 receptor sites, which slows activation of the detrusor muscles. They are tertiary amine compounds, except for trospium chloride, which is a quaternary amine. Due to the lack of specificity of these drugs to the M2 and M3 receptors, they are known to have anticholinergic side effects, as well as occasional cognitive side effects.<sup>5</sup> Trospium chloride and tolterodine cross the blood-brain barrier less than the other drugs. These medications have side effects such as dry mouth, dry eyes, urinary retention, and constipation. Studies show that 5% to 25% of patients discontinue OAB medication because of perceived severe side effects, the majority within the first 6 weeks of use.<sup>6</sup>

Medication dosing often requires titration to achieve a desired effect; however, the side effects of the higher dosage may be less tolerable. The severity and timing of the patient symptoms, as well as the half-life of the medication, will determine dosage and administration. If the initial drug chosen for treatment does not achieve the desired effect, other drugs within the class may relieve symptoms more effectively. The number of medications clinicians or patients are willing to attempt prior to abandoning medical therapy is variable; this decision should be made with the patient's preferences and goals in mind.

In addition to antimuscarinics, timed voiding, fluid restriction, and pelvic floor PT with or without electrical stimulation have been shown to have modest benefit in controlling OAB.<sup>7</sup> Patients must be motivated to attend pelvic floor therapy sessions and continue therapeutic work at home in order to maximize benefit. Contrary to common patient and clinician perceptions, most insurance carriers will cover some or all of the cost.

Pelvic floor PT is designed to strengthen the pelvic floor muscles and enhance levator ani maximum squeeze pressure. The micturition reflex relies on both contraction of the detrusor muscles and the relaxation of the external urethral sphincter and pelvic floor musculature. For some women, the ability

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**TABLE. FDA-Approved Medications for Overactive Bladder**

Brand Name	Generic Name	Dosages Available
Detrol®/Detrol® LA	Tolterodine	4 mg
Ditropan®/Ditropan® XL	Oxybutynin	5-15 mg
VESIcare®	Solifenacin	5-10 mg
Enablex®	Darifenacin	7.5-15 mg
Sanctura®	Trospium chloride	20-40 mg
Toviaz®	Fesoterodine	4-8 mg
Gelnique®	Oxybutynin transdermal ointment	100 mg per gram individual sachet

to recognize the appropriate muscles during an increased abdominal pressure event or in response to a sudden urge episode can prevent urinary leakage or delay urge incontinence via increased warning time.

The ideal treatment goal is to achieve a strong pelvic floor contraction without using abdominal or accessory musculature for multiple repetitions. Delivering electrical stimulation to the pelvic floor via electromyography during each therapy session may further enhance muscle strengthening.<sup>8</sup> Vaginal weights, available in a variety of sizes, can be added to this regimen to gauge improvement at home.<sup>9</sup> A study by Arvonen et al demonstrated some benefit from use of vaginal weights with regard to decreased urinary leakage episodes when combined with routine PT techniques.<sup>10</sup>

At-home pelvic muscle trainers have also been marketed and may be an appropriate treatment for motivated patients, either after routine PT or in lieu of therapy. There have been several large studies in the literature investigating the role of PT in SUI and UUI symptoms with 4 weeks of group and personal pelvic PT, as well as improvement with home continuation of exercises and behavioral modifications.<sup>11</sup>

Lastly, vaginal atrophy can be an insidious cause of onset of urinary urgency and irritative symptoms. Physical exam may show skin breakdown, thin vaginal tissue, and loss of rugae. In severe examples, agglutination of the labia and clitoral hood may also be present.

Local application of estrogen cream can sometimes help with irritative symptoms.

Additional use of a medium vaginal dilator can also be utilized in order to reach the vaginal apex and to more evenly distribute the vaginal cream. The current recommendation for posthysterectomy is 1 to 2 g nightly for initiation and then spacing out over time. For women with an intact uterus, dose recommendations may vary, but in general less than 4 g per week should be utilized. This allows for 1 g every other night.

It is important to note that to date there have been no publications outlining a perfect regimen for estrogen cream. In addition, caution should be exercised in patients who are recommended to avoid estrogen, such as those with history of breast, ovarian, or endometrial cancer or clotting disorders.

Summarizing all the above conservative options, it must be recognized that some patients may benefit or desire conservative treatments for a variety of lower urinary tract complaints. In many situations, a combination of medication, PT, local estrogen therapy, and barrier devices may be used to optimize patient treatment regimens.

### VOIDING DYSFUNCTION

Voiding dysfunction is any abnormality of micturition with regard to flow and the ability to empty the bladder in a controlled fashion. This includes conditions such as hesitancy, postvoid dribbling, and partial and complete urinary retention. Anatomically, mass effect due to anything from tumor burden to prolapse can cause difficult evacuation and/or obstruction. Functionally, pelvic muscle dyssynergia can cause an inability of the pelvic musculature to relax in response to a detrusor contraction.

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Nervous system abnormalities are also a potential cause for difficulty evacuating the bladder completely. Disorders that may cause nerve damage to the bladder include multiple sclerosis (MS), diabetes, trauma, and brain or spinal cord injury or infection, to name a few.<sup>12</sup> In addition, although rare in women, outlet obstruction due to tumor burden or prostatic hypertrophy can cause urinary retention.

Clinically, urinary retention is suspected when the postvoid residual is greater than 100 mL. If a patient is suspected of having urinary retention, postvoid self-catheterization should be measured for several days to establish a voiding trend, in accompaniment with a bladder diary. A thorough neurologic exam and imaging to rule out mass effect might also be of use with the initial diagnosis.

Depending on the functionality of the bladder neurovasculature and urodynamics results, the detrusor muscle may have altered or diminished functionality. If the detrusor is intact, the patient should be advised to time voids and self-catheterize several times a day, recording residuals to monitor emptying ability. She should be monitored regularly for urinary tract infections and via pyelograms to detect vesical reflux, if there is suspicion of end organ compromise as a result of severe retention. Self-catheterization alone is often a viable option for those patients who have minimal detrusor function due to neurologic damage (eg, MS, diabetes). Most patients with MS will develop bladder dysfunction ranging from hyperactive detrusor response (>50%) to detrusor sphincter dyssynergia (>25%).<sup>13</sup>

It is important to note that although there is off-label use of certain pharmaceutical agents such as Flomax<sup>®</sup> (tamsulosin) and urecholine to increase bladder contractility in patients with retention, there are no clinical trials to our knowledge that support the use of these drugs specifically with regards to improved bladder contractility.

## CONCLUSION

Lower urinary tract disorders can be viewed as a complex algorithm for multiple clinical options. Several key conservative management techniques may be used for all types of urinary incontinence with success. Therapies for voiding dysfunction tend to focus on conservative means as well. As in all facets of pelvic floor therapy, the goals and disease

process should be treated on an individual basis and tailored to the patient.

This is the first of a two part article. Next month the focus is on the nonsurgical management of pelvic organ prolapse and bowel dysfunction.

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