

Nonsurgical treatments for patients with urinary incontinence

Many nonsurgical options, including behavioral and drug therapies, are available to successfully manage urge urinary incontinence, stress urinary incontinence, and mixed urinary incontinence

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CASE Patient has urine leakage that worsens with exercise

At her annual preventative health visit, a 39-year-old woman reports that she has leakage of urine. She states that she drinks “a gallon of water daily” to help her lose the 20 lb she gained during the COVID-19 pandemic. She wants to resume Zumba fitness classes, but exercise makes her urine leakage worse. She started wearing protective pads because she finds herself often leaking urine on the way to the bathroom.

What nonsurgical treatment options are available for this patient?

Nearly half of all women experience urinary incontinence (UI), the involuntary loss of urine, and the condition



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increases with age.¹ This common condition negatively impacts physical and psychological health and has been associated with social isolation, sexual dysfunction, and reduced independence.^{2,3} Symptoms of UI are underreported, and therefore universal screening is recommended for women of all ages.⁴ The diversity of available treatments (**TABLE 1**) provides patients and clinicians an opportunity to develop a plan that aligns with their symptom severity, goals, preferences, and resources.

Types of UI

The most common types of UI are stress urinary incontinence (SUI) and urgency urinary incontinence (UUI). Mixed urinary incontinence (MUI) occurs when symptoms of both SUI and UUI are present. Although the mechanisms that lead to urine leakage vary by the type of incontinence, many primary interventions improve both types of leakage, so a clinical diagnosis is sufficient to initiate treatment.

Stress urinary incontinence results from an impaired or weakened sphincter, which leads to involuntary, yet predictable, urine loss during increased abdominal pressure, such as coughing, laughing, sneezing, lifting, or physical activity.⁵ In UUI, involuntary loss of urine often accompanies the sudden urge to void. UUI is associated with overactive bladder (OAB), defined as urinary urgency, with or without urinary incontinence, usually accompanied by urinary frequency and/or nocturia (urination that interrupts sleep).⁶

In OAB, the detrusor muscle contracts randomly, leading to a sudden urge to void. When bladder pressure exceeds urethral sphincter closure pressure, urine leakage occurs. Women describe the urgency episodes as unpredictable, the urine leakage as prolonged with large volumes, and often occurring as they seek the toilet. Risk factors include age, obesity, parity, history of vaginal delivery, family history, ethnicity/race, medical comorbidities, menopausal status, and tobacco use.⁵

Making a diagnosis

A basic office evaluation is the most key step for diagnostic accuracy that leads to treatment success. This includes a detailed history, assessment of symptom severity, physical exam, pelvic exam, urinalysis, post-void residual (to rule out urinary retention), and a cough stress test (to demonstrate SUI). The goal is to assess symptom severity, determine the type of UI, and identify contributing and potentially reversible factors, such as a urinary tract infection, medications, pelvic organ prolapse, incomplete bladder emptying, or impaired neurologic status. In the absence of the latter, advanced diagnostic tests, such as urodynamics, contribute little toward discerning the type of incontinence or changing first-line treatment plans.⁷

During the COVID-19 pandemic, abbreviated, virtual assessments for urinary symptoms were associated with high degrees of satisfaction (91% for fulfillment of personal needs, 94% overall satisfaction).⁸ This highlights the value of validated symptom questionnaires that help establish a working diagnosis and treatment plan in the absence of a physical exam. Questionnaire-based diagnoses have acceptable accuracy for classifying UUI and SUI among women with uncomplicated medical and surgical histories and for initiating low-risk therapies for defined intervals.

The 3 incontinence questions (3IQ) screen is an example of a useful, quick diagnostic tool designed for the primary care setting (FIGURE 1, page 38).⁹ It has been used in pharmaceutical treatment trials for UUI,

TABLE 1 Nonsurgical treatments for urinary incontinence

Stress urinary incontinence	Urge urinary incontinence
Behavioral modifications	Behavioral modifications
Pelvic floor exercises	Pelvic floor exercises
Continence support devices	Bladder retraining
Urethral inserts or patches	Medications (antimuscarinic agents and β -adrenergic agonists)
Periurethral bulking	Intravesical onabotulinumtoxinA injections
	Posterior tibial nerve stimulation

with low frequency of misdiagnosis (1%–4%), resulting in no harm by the drug treatment prescribed or by the delay in appropriate care.¹⁰ Due to the limitations of an abbreviated remote evaluation, however, clinicians should assess patient response to primary interventions in a timely window. Patients who fail to experience satisfactory symptom reduction within 6 to 12 weeks should complete their evaluation in person or through a referral to a urogynecology program.

Primary therapies for UI

Primary therapies for UUI and SUI target strength training of the pelvic floor muscles, moderation of fluid intake, and adjustment in voiding behaviors and medications. Any functional barriers to continence also should be identified and addressed. Simple interventions, including a daily bowel regimen to address constipation, a bedside commode, and scheduled voiding, may reduce incontinence episodes without incurring significant cost or risk. For women suspected of having MUI, the treatment plan should prioritize their most bothersome symptoms.

Lifestyle and behavioral modifications

Everyday habits, medical comorbidities, and medications may exacerbate the severity of both SUI and UUI. Behavioral therapy alone or in combination with other interventions effectively reduces both SUI and UUI symptoms and has been shown to improve the

FAST TRACK

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Q1: During the last 3 months have you leaked urine (even a small amount)?

Yes (refer to question 2)

No (end of questions)

Q2: During the last 3 months did you leak urine: (check all that apply)

When you were performing some physical activity, such as coughing, sneezing, lifting, or exercise

When you had the urge or the feeling that you needed to empty your bladder, but you couldn't get to the toilet fast enough

Without physical activity and without a sense of urgency

Q3: During the last 3 months did you leak urine most often: (check only one)

When you were performing some physical activity, such as coughing, sneezing, lifting, or exercise

When you had the urge or the feeling that you needed to empty your bladder, but you couldn't get to the toilet fast enough

Without physical activity and without a sense of urgency

Key

- Most often with physical activity: Stress-only or stress-predominant urinary incontinence
- Most often with the urge to empty the bladder: Urge-only or urge-predominant urinary incontinence
- Without physical activity or sense of urgency: Incontinence due to other causes
- About equally with physical activity and sense of urgency: A mix of incontinence types

FIGURE 1 A brief screening questionnaire: 3 incontinence questions (3IQ)⁹

efficacy of continence surgery.¹¹ Information gained from a 3-day bladder diary (**FIGURE 2**)¹² can guide clinicians on personalized patient recommendations, such as reducing excessive consumption of fluids and bladder irritants, limiting late evening drinking in the setting of bothersome nocturia, and scheduling voids (every 2–3 hours) to preempt incontinence episodes.

Weight loss

Obesity is a strong, independent, modifiable risk factor for both SUI and UUI. Each 5 kg/m² increase in body mass index (BMI) has been associated with a 20% to 70% increased risk of UI, while weight loss of 5% or greater in overweight or obese women can lead to at least a 50% decrease in UI frequency.¹³

Reducing fluid intake and bladder irritants

Overactive bladder symptoms often respond to moderation of excessive fluid intake and reduction of bladder irritants (caffeine, carbonated beverages, diet beverages, and alcohol). While there is no established definition of excess caffeine intake, one study categorized high caffeine intake as greater than 400 mg/day (approximately four 8-oz cups of coffee).¹⁴

Information provided in a bladder diary can guide individualized recommendations for reducing fluid intake, particularly when 24-hour urine production exceeds the normative range (> 50–60 oz or 1.5–1.8 L/day).¹⁵ Hydration needs vary by activity, environment, and food; some general guidelines suggest 48 to 64 oz/day.^{5,16}

Pelvic floor muscle training

An effective treatment for both UUI and SUI symptoms, pelvic floor muscle training (PFMT) leads to high degrees of patient satisfaction and improvement in quality of life.¹⁷ The presumed mechanisms of action of PFMT include improved urethral closure pressure and inhibition of detrusor muscle contractions.

Common exercise protocols recommend 3 sets of 10 contractions, held for 6 to 10 seconds per day, in varying positions of sitting, standing, and lying. While many women may be familiar with Kegel exercises, poor technique with straining and recruitment of gluteal and abdominal muscles can undermine the effect of PFMT. Clinicians can confirm successful pelvic muscle contractions by placing a finger in the vagina to appreciate contraction around and elevation of the finger toward the pubic symphysis in the absence of pushing.

Referral to supervised physical therapy and use of such teaching aid tools as booklets, mobile applications, and biofeedback can improve exercise adherence and outcomes.^{18,19} Systematic reviews report initial cure or improvement of incontinence symptoms as high as 74%, although little information is available about the long-term duration of effect.¹⁷

Vaginal pessaries

Vaginal continence support pessaries and devices work by stabilizing urethral mobility

and compression of the bladder neck. Continence devices are particularly effective for situational SUI (such as during exercise).

The reusable medical grade silicone pessaries are available in numerous shapes and sizes and are fitted by a health care clinician (FIGURE 3, page 40). Uresta is a self-fitted intra-vaginal device that women can purchase online with a prescription. The Poise Impressa bladder support is a disposable intravaginal device marketed for incontinence and available over-the-counter, without a prescription (FIGURE 4, page 41). Anecdotally, many women find that menstrual tampons provide a similar effect, but outcome data are lacking.

In a comparative effectiveness trial of a continence pessary and behavior therapy, behavioral therapy was more likely to result in no bothersome incontinence symptoms (49% vs 33%, $P = .006$) and greater treatment satisfaction at 3 months.²⁰ However, these short-term group differences did not persist at 12 months, presumably due to waning adherence.

UUI-specific nonsurgical treatments

Drug therapy

All medications approved by the US Food and

FIGURE 2 Sample fluid intake and voiding diary¹²
Reprinted with permission, American Urogynecologic Society. https://www.voicesforpfd.org/assets/2/6/Voiding_Diary.pdf.

Drug Administration (FDA) for UI are for the indications of OAB or UUI. These second-line treatments are most effective as adjuncts to behavioral modifications and PFMT.

A multicenter randomized trial that evaluated the efficacy of drug therapy alone compared with drug therapy in combination with

TABLE 2 FDA-approved medications for treatment of overactive bladder and urgency urinary incontinence

Medication name (generic)	Medication class	Starting dose	Maximum dose
Oxybutynin	Anticholinergic	IR: 5 mg up to 4 times daily XR: 5–10 mg daily	30 mg daily
Solifenacin	Anticholinergic	5 mg daily	10 mg daily
Tolterodine	Anticholinergic	IR: 1 mg twice a day XR: 2 mg daily	IR: 2 mg twice a day XR: 4 mg daily
Trospium	Anticholinergic	IR: 20 mg daily XR: 60 mg daily	IR: 20 mg twice a day XR: Same as starting dose
Darifenacin	Anticholinergic	7.5 mg daily	15 mg daily
Fesoterodine	Anticholinergic	4 mg daily	8 mg daily
Mirabegron	β -3 adrenergic agonist	25 mg daily	50 mg daily
Vibegron	β -3 adrenergic agonist	75 mg daily	Same as starting dose

Abbreviations: FDA, US Food and Drug Administration; IR, immediate release; XR, extended release.

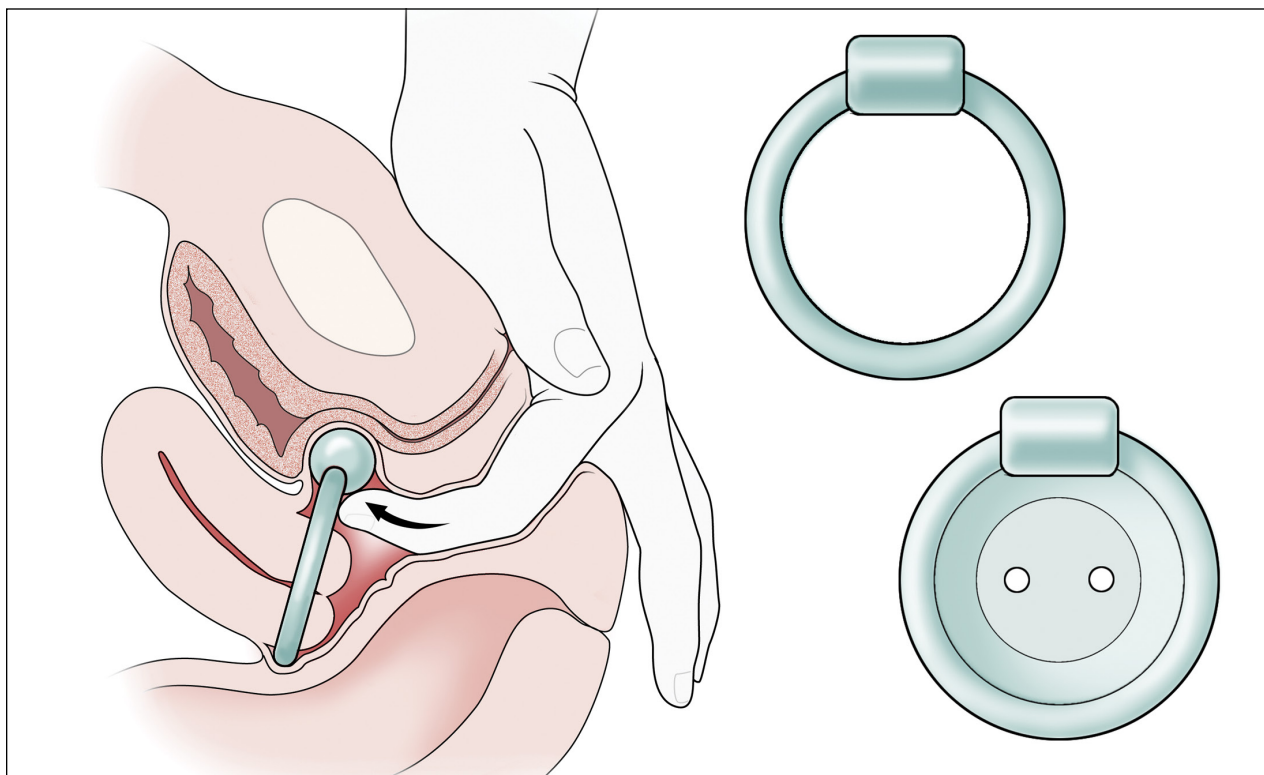


ILLUSTRATION BY MARCIA HARTSOCK FOR OBG MANAGEMENT

FIGURE 3 Vaginal continence support pessaries

behavioral modification, PFMT, urge suppression strategies, timed voiding, and fluid management for UUI found that combined therapy was more successful in achieving greater than 70% reduction in incontinence episodes (58% for drug therapy vs 69% for combined therapy).²¹

Of the 8 medications currently marketed in the United States for OAB or UUI, 6 are anticholinergic agents that block muscarinic receptors in the smooth muscle of the bladder, leading to inhibition of detrusor contractions, and 2 are β -adrenergic receptor agonists that promote bladder storage capacity by relaxing the detrusor muscle (TABLE 2, page 39). Similar efficacies lead most clinicians to initiate drug therapy based on formulary coverage and tolerance for adverse effects. Patients can expect a 53% to 80% reduction in UUI episodes and a 12% to 32% reduction in urinary frequency.²²

Extended-release formulations are associated with reduced anticholinergic side effects (dry mouth, constipation, somnolence, dry eyes), leading to improved

adherence. Notably, the anticholinergic medications are contraindicated in patients with untreated narrow-angle glaucoma, gastric retention, and supraventricular tachycardia. Mirabegron should be used with caution in patients with poorly controlled hypertension.⁵ Due to concerns regarding the association between cumulative anticholinergic burden and the development of dementia, clinicians may consider avoiding the anticholinergic medications in older and at-risk patients.²³

UUI office-based procedure treatments

If behavioral therapies and medications are ineffective, contraindicated, or not the patient’s preference, additional FDA-approved therapies for UUI are available, typically through referral to a urogynecologist, urologist, or continence center.

Posterior tibial nerve stimulation (PTNS) is a nondrug treatment that delivers electrical stimulation using an acupuncture needle for 12 weekly 30-minute sessions followed by

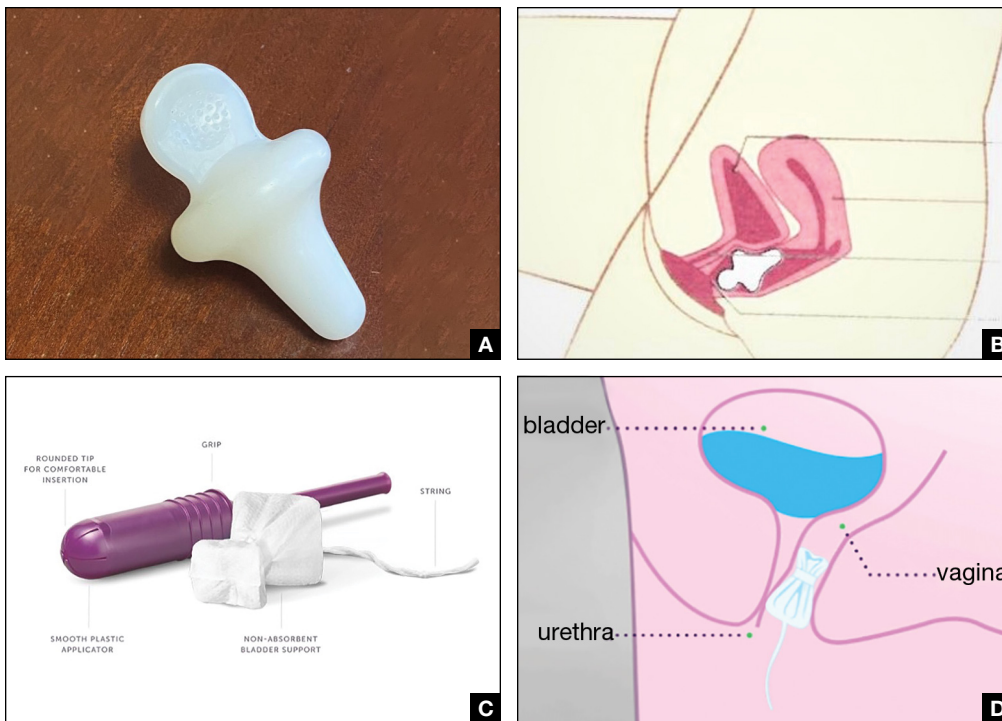


FIGURE 4 Uresta (A,B) and Poise Impressa (C,D) intravaginal devices for incontinence management
 Images used with permission of Uresta (Uresta) and Poise and Kimberly-Clark Corporation (Impressa).

monthly maintenance for responders. The time commitment for this treatment plan can be a barrier for some patients. However, patients who adhere to the recommended protocol can expect a 60% improvement in symptoms, with minimal adverse events. Treatment efficacy is comparable to that of anticholinergic medication.²⁴

OnabotulinumtoxinA injections into the bladder muscle are performed cystoscopically under local anesthetic. The toxin blocks the presynaptic release of acetylcholine at the neuromuscular junction, resulting in temporary muscle paralysis. This treatment is associated with high satisfaction. Efficacy varies by study population and outcome measure.

In one US comparative effectiveness trial, 67% of study participants with UUI symptoms refractory to oral medication reported a greater than 50% reduction in OAB symptoms at 6 months, 20% reported complete resolution of UUI, and 72% requested a second injection within 24 months.²⁵ The interval between the first and second injection was nearly 1 year

(350 days). Risks include urinary tract infection (12% within 1 month of the procedure and 35% through 6 months); urinary retention requiring catheterization has decreased to 6% with recognition that most moderate retention is tolerated by patients.

Some insurers limit onabotulinumtoxinA treatment coverage to patients who have failed to achieve symptom control with first- and second-line treatments.

SUI-specific nonsurgical treatments

Cystoscopic injection of urethral bulking agents into the urethral submucosa is designed to improve urethral coaptation. It is a minor procedure that can be performed in an ambulatory setting under local anesthetic with or without sedation.

Various bulking agents have been approved for use in the United States, some of which have been withdrawn due to complications of migration, erosion, and pseudoabscess formation. Cure or improvement

FAST TRACK

Cystoscopic injection of urethral bulking agents is a minor procedure that can be performed in an ambulatory setting under local anesthetic with or without sedation

after bulking agent injection was found to be superior to a home pelvic floor exercise program but inferior to a midurethral sling procedure for cure (9% vs 89%).²⁶

The durability of currently available urethral bulking agents beyond 1 year is unknown. Complications are typically minor and transient and include pain at the injection site, urinary retention, de novo urgency, and implant leakage. The advantages include no postprocedure activity restrictions.

CASE Symptom presentation guides treatment plan

Our patient described symptoms of stress-predominant MUI. She was counseled to moderate her fluid intake to 2 L per day and to strategically time voids (before exercise, and at least every 4 hours). The patient was fitted with an incontinence pessary, and she elected to pursue a course of supervised physical therapy for pelvic floor muscle strengthening. Her follow-up visit is scheduled in 3 months to determine if other interventions are warranted. ●

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