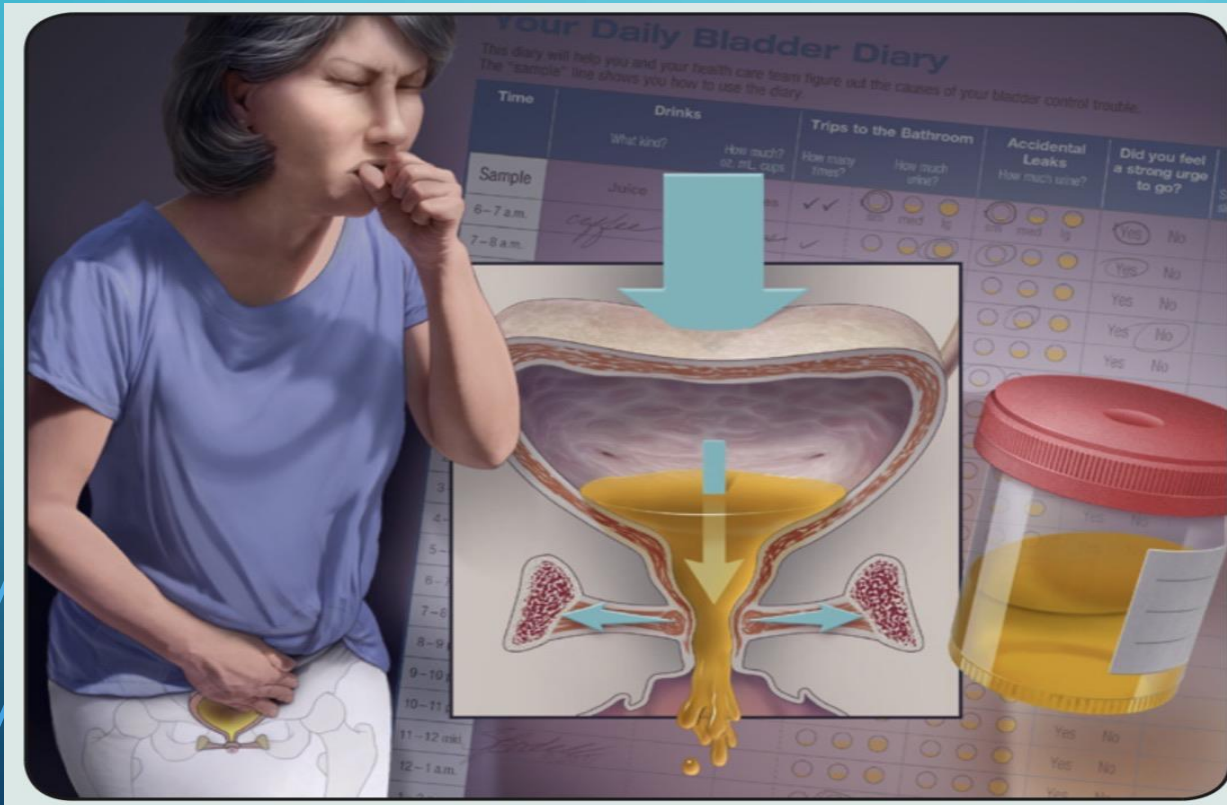


An illustration of a woman with grey hair, wearing a blue t-shirt and white pants, looking distressed with her hand to her mouth. In the background, there is a 'Your Daily Bladder Diary' form. The form has columns for 'Time', 'Drinks', 'Trips to the Bathroom', 'Accidental Leaks', and 'Did you feel a strong urge to go?'. A large blue arrow points from the 'Drinks' section to a diagram of a human bladder. The diagram shows yellow liquid (urine) entering the bladder and then leaking out through the urethra. To the right of the diagram is a clear plastic container with a red lid, partially filled with yellow liquid, representing a urine sample.



A decorative graphic on the left side of the slide, consisting of a network of white lines and circles on a blue gradient background, resembling a circuit board or a neural network.

URINARY INCONTINENCE (UI)

DEFINED AS ANY COMPLAINT OF INVOLUNTARY LOSS OF URINE

IT IS A COMMON ISSUE, WITH A PREVALENCE OF 51% AMONG ADULT WOMEN IN
THE UNITED STATES

COMORBIDITIES:

include : •

1. decreased quality of life (QOL) and productivity; •
- 2 .increased anxiety and depression; •
3. increased urinary tract and skin infections; •
- 5.increased risk for falls and nonspine, nontraumatic fractures in older women; and •
6. increased caregiver burden •

A study found that UI was associated with a 24% increased risk of all-cause •
mortality among older institutionalized adults

CLASSIFICATION:

UI can be transient or chronic

Transient UI arises suddenly, lasts less than six months, and can be reversed if the underlying cause is addressed.

Transient or short term cause of incontinence may include :

- 1.UTI
- 2.Pregnancy or after delivery
- 3.Certain medication including diuretics and antidepressants
- 4.Certain beverages like coffee and alcohol
- 5.constipation

WHY DOES PREGNANCY CAUSE INCONTINENCE?

1. Pressure against your bladder: fetus grows and uterus starcture
2. Weak pelvic floor muscle

IS INCONTINENCE MORE COMMON IN WOMEN?

Yes.

Pregnancy , childbirth and menopause can all lead to bladder control problems

Pregnancy and delivery because childbirth strain weakens pelvic floor muscle

Menopause:hormone especially estrogen change during menopause which can affect how you can control your bladder

CHRONIC CAUSE OF INCONTINENCE:

1. Overactive bladder
2. Stroke
3. Diabetes
4. Menopause
5. MS
6. Parkinson disease
7. Enlarged prostate
8. Prostatectomy surgery

CHRONIC UI

Chronic UI is differentiated into:

1. stress
2. urge
3. mixed
4. overflow
5. functional subtypes

STRESS UI:

Stress UI caused by urethral sphincter weakness or urethral hypermobility results in predictable loss of urine with activities that increase intra-abdominal pressure (e.g., exercising, sneezing, laughing).

Stress UI affects 25% to 45% of women older than 30 years.

URGE UI

Urge UI related to detrusor overactivity causes involuntary loss of urine associated with urgency as well as increased urinary frequency or nocturia.

Patients typically lose urine on the way to the toilet.

Prevalence ranges from 9% of women in their forties to 31% of women in their seventies.

MIXED UI:

Mixed UI has components of stress and urge UI

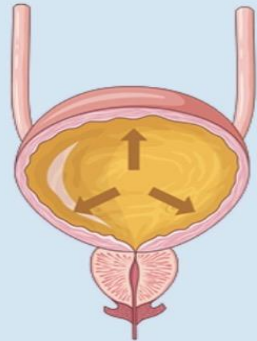
has a prevalence of 20% to 30%

OVERFLOW UI

Overflow UI accounts for 5% of chronic UI because of detrusor underactivity or bladder outlet obstruction, which leads to urinary retention and subsequent leakage

Patients may strain to pass urine or have a sensation of incomplete emptying.

Different types of urinary incontinence



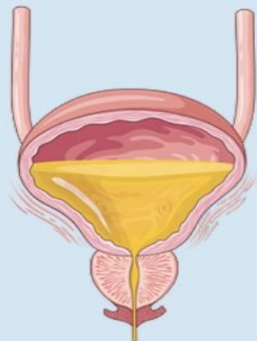
Overflow incontinence:

You dribble a little and can't fully empty your bladder.



Stress incontinence:

Sneezing, coughing or physical activity make you leak.



Urge incontinence:

You feel like you must pee immediately. You may leak before making it to bathroom.



Mixed incontinence:

A combination of conditions make you leak.

FUNCTIONAL UI

Functional UI occurs when there are barriers to toileting, such as cognitive impairment, physical frailty, or immobility.

The number of patients affected by functional UI is unclear

RISK FACTORS:

1. Age
2. Parity
3. Obesity
4. history of hysterectomy
5. increasing medical comorbidity.



Other risk factors include:

diuretic use

poor overall health

high impact exercise.

Vaginal deliveries are associated with an increased risk of UI, but evidence is mixed regarding whether cesarean deliveries have a prolonged protective effect



History:

A thorough history can often distinguish between transient and chronic UI, as well as the subtype of chronic UI.

The mnemonic TOILETED:

- 1.(thin, dry vaginal and urethral epithelium
- 2.obstruction [stool impaction/constipation]
- 3.infection
- 4.limited mobility
- 5.emotional [psychological disorders]
- 6.therapeutic medications
- 7.endocrine disorders delirium)

is helpful to identify causes for transient UI

Table 1 lists medications that frequently cause or exacerbate UI

TABLE 1

Medications and Substances That Affect Urinary Incontinence

Effect	Medication or substance
Decrease bladder contractility (retention and overflow UI)	Angiotensin-converting enzyme inhibitors (may also cause chronic cough) Antidepressants Antihistamines Antimuscarinics Antiparkinsonian agents Antipsychotics Beta-adrenergic agonists Calcium channel blockers Opioids Sedatives, hypnotics Skeletal muscle relaxants
Increase detrusor irritability or creatinine clearance (urge UI)	Alcohol Caffeine Diuretics
Increase urethral sphincter tone (retention and overflow UI)	Alpha-adrenergic agonists Amphetamines Tricyclic antidepressants
Decrease urethral sphincter tone (stress UI)	Alpha-adrenergic antagonists

UI = urinary incontinence.

Information from reference 13.

Physical Examination:

Physical examination should be guided by the patient's history and may include pelvic and neurologic examinations with cognitive and functional assessments.

1. The cough stress test should be included in the initial evaluation of women with stress UI symptoms.

It has excellent reliability, sensitivity, and specificity for identifying stress UI when compared with urodynamic testing.

The patient's bladder should have at least 200 to 300 mL of urine or be at symptomatic fullness. The patient is then asked to cough while the physician observes for urine leakage. Immediate leakage is consistent with stress UI.

The test can be performed in the supine or standing position but is more sensitive in the standing position.

If the test is initially performed in the supine position with a negative result, it should be repeated in the standing position if possible.



2. The cotton swab test can be performed to evaluate for urethral hypermobility. After lubrication or application of intraurethral lidocaine jelly, the swab is inserted into the bladder through the urethra. The patient is asked to do the Valsalva maneuver. A change in cotton swab angle more than 30 degrees from resting position is considered positive, indicating urethral hypermobility.

3. Measurement of postvoid residual is traditionally part of the initial evaluation but is not necessary in all patients with uncomplicated UI. If performed, ultrasonography should be used if available because it is as accurate and less invasive than catheterization.

Postvoid residual can be measured as a precaution to exclude significant urinary retention; it should be measured in patients being considered for subspecialty referral or those receiving treatments that may cause or worsen voiding dysfunction.

4. Urodynamic testing is rarely needed in a primary care setting and should not routinely be performed in the initial workup for uncomplicated UI.





Laboratory Tests and Imaging:

Urinalysis should be ordered on all patients to evaluate for urinary tract infection and to exclude hematuria, proteinuria and glycosuria.

Renal function should be assessed if there is concern for obstruction.

Routine imaging should not be performed in the initial assessment of uncomplicated UI other than the use of ultrasonography to assess postvoid residual.



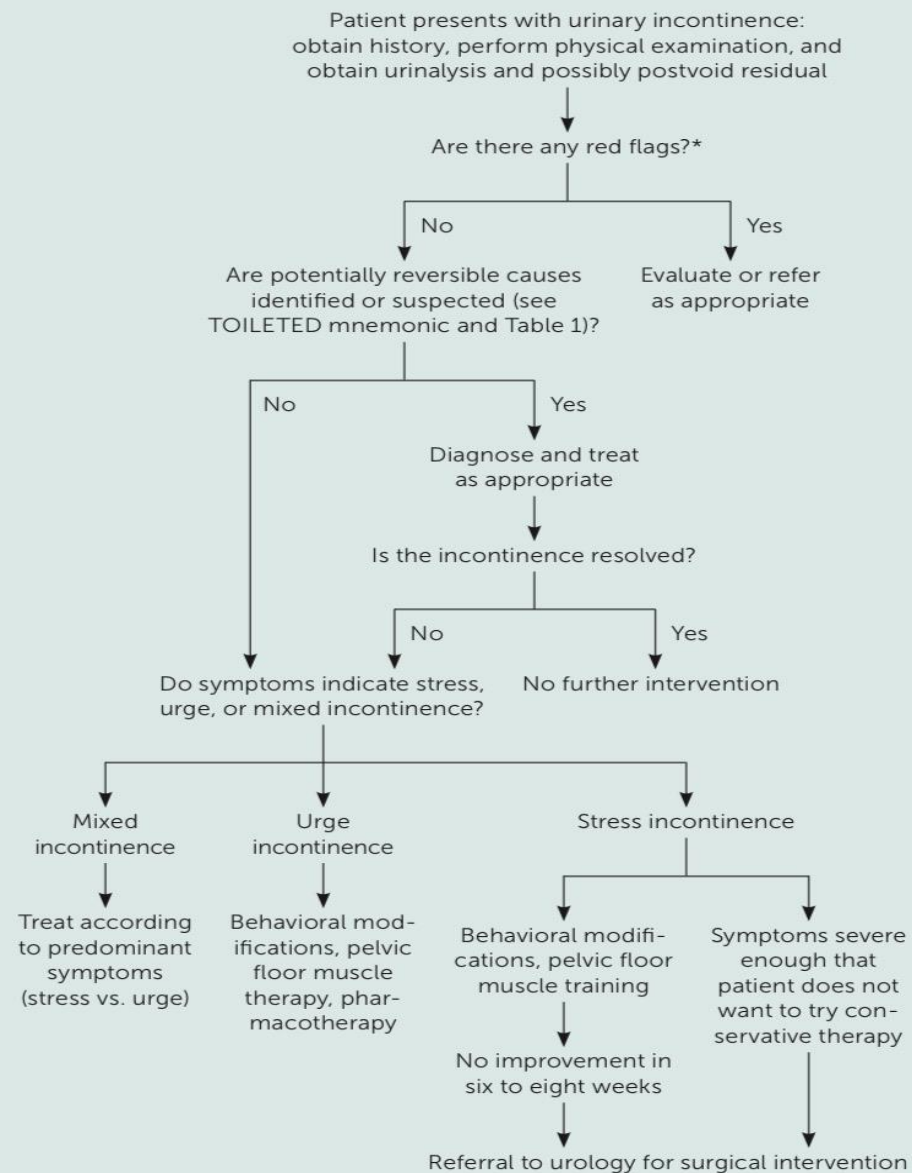


General Approach to Management:

A step-wise approach to treatment is directed at the UI subtype, starting with conservative management, escalating to physical devices and medications, and ultimately referring for surgical intervention (Figure 3).



FIGURE 3



*—Red flags: conditions indicating need for further evaluation or referral for specialty care include associated pain, persistent hematuria or proteinuria, significant pelvic organ prolapse, previous pelvic surgery or radiation, suspected fistula, elevated postvoid residual.

Table 2 summarizes treatment options for UI

TABLE 2

Treatment Options for Chronic Urinary Incontinence

Type	Conservative management	Pharmacologic	Surgical
Stress	Appropriate fluid intake Constipation management Electrical stimulation (home electrode-stimulation therapy of the vagina or anus) Mechanical devices (vaginal inserts, urethral plugs) Pelvic floor muscle strengthening (Kegel exercises, pelvic floor muscle training) Smoking cessation Weight loss	Alpha-adrenergic agonists* Duloxetine (Cymbalta)*	Intravesical balloons Periurethral injections of bulking agents Sling procedures Urethropexy
Urge	Appropriate fluid intake Bladder training Constipation management Electrical stimulation (percutaneous tibial nerve stimulation) Pelvic floor muscle strengthening (Kegel exercises, pelvic floor muscle training) Weight loss	Antimuscarinics Intravaginal estrogen* Mirabegron	Neuromodulation OnabotulinumtoxinA (Botox)
Mixed	Combination of above treatments with focus on dominant symptoms		
Overflow	Clean intermittent catheterization Indwelling urethral catheter Relief of obstruction	Alpha-adrenergic antagonists	Suprapubic catheter

*—Not approved by the U.S. Food and Drug Administration for treatment of urinary incontinence.

Adapted with permission from Hersh L, Salzman B. Clinical management of urinary incontinence in women [published correction appears in Am Fam Physician. 2013;88(7):427]. Am Fam Physician. 2013;87(9):634-640. Accessed July 16, 2019. <https://www.aafp.org/afp/2013/0501/p634.html>

Table 3 lists pharmacologic therapies.

TABLE 3

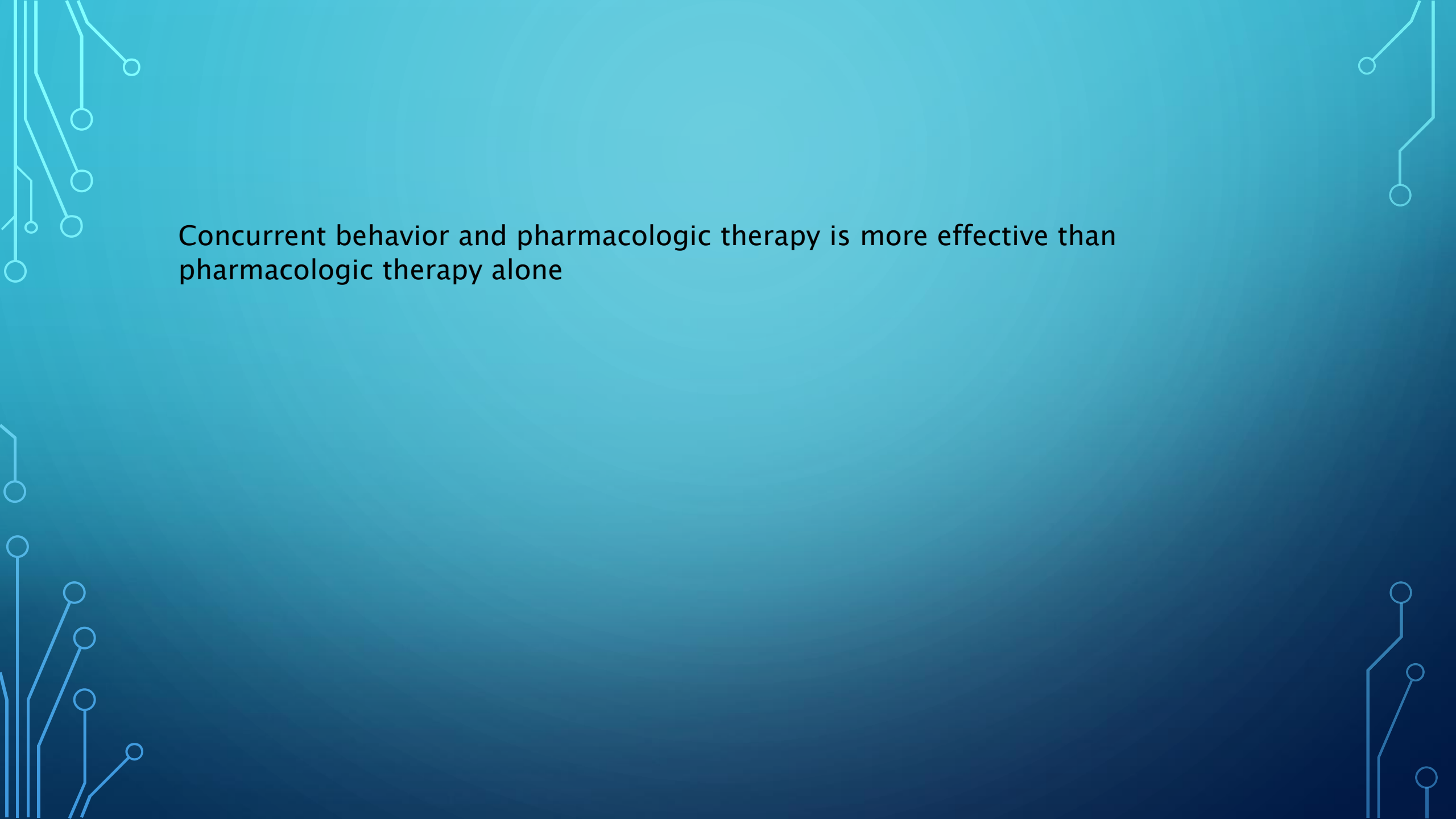
Medications for Treatment of Urinary Incontinence

Agent	Dosage	Cost*
Oral agents		
Antimuscarinic (selective)		
Darifenacin ER (Enablex): low dosage	7.5 mg daily	\$90 to \$145
Darifenacin ER: maximum dosage	15 mg daily	\$90 to \$110
Solifenacin (Vesicare): low dosage	5 mg daily	\$135 to \$145
Solifenacin: maximum dosage	10 mg daily	\$135 to \$145
Antimuscarinic (nonselective)		
Oxybutynin: low dosage	5 mg daily	\$10 to \$12
Oxybutynin: intermediate dosage	10 mg daily	\$15 to \$20
Oxybutynin: maximum dosage	30 mg daily	\$30 to \$45
Tolterodine (Detrol): low dosage	2 mg daily	\$25 to \$40
Tolterodine: maximum dosage	4 mg daily	\$40 to \$70
Beta-adrenergic		
Mirabegron†: low dosage	25 mg daily	\$385 to \$410
Mirabegron†: maximum dosage	50 mg daily	\$385 to \$410
Selective serotonin reuptake inhibitor		
Duloxetine (Cymbalta)‡	40 mg twice daily	\$140 to \$190
Intravesicular injection		
Neuromuscular blocker		
OnabotulinumtoxinA (Botox)†	100 units/ 1 mL every 6 months	\$600 to \$630
Transdermal agents		
Antimuscarinic (nonselective)		
Oxybutynin†	One patch twice weekly	\$30
Estrogen derivative		
Vaginal estrogen (estradiol [Estrace], estrogen [Premarin])‡	0.5 to 2 g twice weekly	\$95 to \$350

*—Estimated retail price for one month's treatment based on information obtained at <http://www.goodrx.com> (accessed June 24, 2019). Actual cost will vary with insurance and by region.

†—Not available in generic form.

‡—Not approved by the U.S. Food and Drug Administration for treatment of urinary incontinence.

The background is a blue gradient. In the corners, there are white line art designs resembling electronic circuit boards or neural networks, with lines and small circles.

Concurrent behavior and pharmacologic therapy is more effective than pharmacologic therapy alone



CONSERVATIVE MANAGEMENT:

Despite low-quality evidence to suggest that lifestyle interventions improve UI, these interventions are inexpensive with low risk of side effects.

It is reasonable for physicians to counsel patients on appropriate fluid intake timed voiding, reduction of caffeinated and carbonated beverages, smoking cessation, regular moderate physical activity, and weight loss if patient is overweight or obese.

Overly aggressive fluid restriction should be avoided because of potential adverse effects of headaches, constipation, and thirst.





Optimized management of medications and comorbidities, especially in geriatric patients, may reverse transient UI or improve chronic UI.

Pelvic floor muscle strengthening exercises, such as Kegel exercises, are the mainstay of behavior therapy for stress UI, with cure rates varying from 29% to 59% in systematic reviews when compared with no treatment, the number needed to treat for benefit is three patients (95% CI, 2 to 5).

A referral for clinically guided pelvic floor muscle training, including manual feedback, biofeedback, and weighted intravaginal cones, may be more effective if the patient has difficulty contracting her pelvic floor muscles voluntarily.

Table 4 provides examples of interventions that may reduce UI symptoms



TABLE 4

Common Behavior Therapies for Urinary Incontinence

Intervention	Description	Indication	Guidance
Appropriate fluid intake	Reminder to avoid excessive fluid intake, especially late at night	Urge incontinence in patients without cognitive impairment	Recommend appropriate fluid intake (50 to 70 oz daily) in smaller increments (e.g., 10 to 12 five-oz glasses daily) Avoid fluids several hours before bedtime and overnight Ideal 24-hour voiding volume is 40 to 50 oz If 24-hour voiding volume is less than 40 oz (and no additional volume attributable to urine leakage), increase fluid intake
Bladder training	Retrain pelvic mechanisms and the central nervous system to inhibit urge sensation between voids	Urge incontinence in patients without cognitive impairment	Instruct the patient as follows: Remain stationary when urgency occurs Concentrate on decreasing the sense of urgency through rapid successive pelvic muscle contractions, mental distraction, and relaxation techniques After controlling the sense of urgency, walk slowly to the bathroom and void After mastering this, attempt to extend the time that urination can be postponed; aim to extend the interval by 30 to 60 minutes Continue this process until voiding occurs every three to four hours without incontinence
Habit training	Individualized toiletting scheduled to preempt involuntary voiding	Urge incontinence in patients with cognitive impairment	Check for wetness at intervals to determine when the patient urinates Take the patient to the toilet or provide bedside commode or bedpan at intervals slightly shorter than the patient's normal voiding interval
Pelvic floor muscle exercises (Kegel exercises)	Muscle contraction and relaxation to reduce incontinence by producing urethral closure and decreasing central nervous system stimulation of detrusor muscle	Urge and/or stress incontinence in patients without cognitive impairment	Assist the patient in isolating pelvic floor muscles by instructing her to hold urine during urination and to feel pelvic muscle floor contraction (while avoiding buttock, abdomen, or thigh muscle contraction) Ask the patient to perform three sets of eight to 10 contractions (held for six to eight seconds) three to four times weekly; extend contraction time to 10 seconds, if possible Continue regimen for at least 15 to 20 weeks
Prompted voiding	Reminder to urinate on a regular schedule	Urge incontinence in patients with cognitive impairment	Remind the patient to use the toilet at regular intervals, ideally timed to the patient's normal voiding intervals
Scheduled voiding	Voiding on a regular schedule	Urge incontinence in patients with cognitive impairment	Take the patient to the toilet at regular intervals (e.g., every two to three hours)

Adapted with permission from Hersh L, Salzman B. Clinical management of urinary incontinence in women [published correction appears in Am Fam Physician. 2013;88(7):427]. Am Fam Physician. 2013;87(9):634-640. Accessed July 16, 2019. <https://www.aafp.org/afp/2013/0501/p634.html>, with additional information from reference 42.

STRESS UI

Mechanical devices for stress UI management include vaginal inserts (cones, pessaries) and urethral plugs. These devices frequently require intravaginal estrogen before use and are most often discontinued because of poor fit⁴⁸; however, they may be effective in patients with predictable, episodic symptoms (e.g., during exercise, pregnancy), in nonsurgical candidates, or in those awaiting surgery. Up to one-third of patients who use urethral plugs develop urinary tract infections in a two-year period, but patient satisfaction remains high with this device.



No medications are approved by the U.S. Food and Drug Administration (FDA) for treatment of stress UI

the American College of Physicians recommends against systemic pharmacotherapy. Alpha-adrenergic agonists (e.g., pseudoephedrine, phenylephrine) have previously been prescribed as adjunct therapy because they act on receptors in the proximal urethra and bladder neck.

Significant adverse effects include palpitations and headache. Behavior therapy has significantly improved outcomes when compared with alpha agonists, and alpha agonists are no longer recommended for stress UI.

Duloxetine (Cymbalta) has alpha-agonist properties with low strength of evidence regarding effectiveness or improved QOL.

No strong evidence supports the use of tricyclic antidepressants or hormone therapy.





The injection of trans- or periurethral bulking agents can be considered for treatment of stress UI, although there is low-quality evidence to show improved outcomes compared with no treatment.

Adverse effects include urinary retention, urgency, dysuria, and infection; repeat injections are often needed.

Intravesical balloons are more effective than sham therapy and, by indirect comparison, more effective than behavior therapy combined with neuromodulation.

Home electrode-stimulation therapy of the vagina or anus is a Medicare-covered option for patients who cannot voluntarily contract their pelvic floor muscles. Urologic surgery for stress UI includes sling procedures and urethropexy to support urethral constriction or to stabilize the bladder neck and urethra. There is no consensus on the best surgical approach; obesity, diabetes, age, and desire for future fertility are not absolute contraindications to surgery



URGE UI:

Antimuscarinics and beta-adrenergic agonists are FDA-approved oral medications for urge UI.

Antimuscarinics prevent recurrent spasm of the detrusor muscle, but side effects include tachycardia, edema, confusion, constipation, and blurry vision.

Selective antimuscarinic agents (darifenacin [Enablex], solifenacin [Vesicare]) are preferred over nonselective agents (oxybutynin, tolterodine [Detrol]) to reduce cognitive side effects.

Antimuscarinics are not recommended as first-line pharmacotherapy in older adults.

Mirabegron is a beta-adrenergic agonist that relaxes the detrusor muscle via beta-3 receptors. Adverse effects include gastrointestinal upset, dizziness, headache, and increased blood pressure. Concurrent use with antimuscarinics increases the risk of urinary retention.

Intravaginal estrogen may improve urge UI symptoms but is not approved by the FDA for this indication; systemic estrogen exacerbates incontinence

Percutaneous tibial nerve stimulation requires weekly procedures for the initial three months and subsequent monthly maintenance treatments.

It has similar effectiveness as antimuscarinic medications.

Intravesical onabotulinumtoxinA (Botox) injection delivered via cystoscopy is approved by the FDA and results in flaccid paralysis of the detrusor muscle; studies show consistent improvement in UI and QOL. The procedure can be repeated every six months as symptoms recur.

Sacral, pudendal, and paraurethral nerve stimulators can be surgically implanted; 60% to 90% of patients with sacral neuromodulators report improvement in symptoms.

These devices are expensive and are indicated only for patients with refractory symptoms because of the risk of surgical complications.

A 2016 study showed that onabotulinumtoxinA was superior to neuromodulation devices for reduction of UI.



MIXED, OVERFLOW, AND FUNCTIONAL UI:

Management of mixed UI should be directed toward treating predominant symptoms. Reversible causes of overflow UI should be identified (e.g., stopping medications that cause urinary retention; see Table 113).

Intermittent or indwelling catheterization is often required if the etiology is irreversible (e.g., neurologic dysfunction because of stroke).

Behavior therapies, such as assisted and timed toileting, are the primary treatment for functional incontinence.



Indications for Referral

subspecialist referral should be considered for complicated UI to include associated pain, persistent hematuria or proteinuria, significant pelvic organ prolapse, previous pelvic surgery or radiation, suspected fistula, or elevated postvoid residual