ACP American College of Physicians℠ Leading Internal Medicine, Improving Lives

CLINICAL GUIDELINE

Nonsurgical Management of Urinary Incontinence in Women: A Clinical Practice Guideline From the American College of Physicians

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Description: The American College of Physicians (ACP) developed this guideline to present the evidence and provide clinical recommendations on the nonsurgical management of urinary incontinence (UI) in women.

Methods: This guideline is based on published English-language literature on nonsurgical management of UI in women from 1990 through December 2013 that was identified using MEDLINE, the Cochrane Library, Scirus, and Google Scholar. The outcomes evaluated for this guideline include continence, improvement in UI, quality of life, adverse effects, and discontinuation due to adverse effects. It grades the evidence and recommendations by using ACP's guideline grading system. The target audience is all clinicians, and the target patient population is all women with UI.

Recommendation 1: ACP recommends first-line treatment with pelvic floor muscle training in women with stress UI. (Grade: strong recommendation, high-quality evidence)

Recommendation 2: ACP recommends bladder training in women with urgency UI. (Grade: strong recommendation, moderate-quality evidence)

Recommendation 3: ACP recommends pelvic floor muscle training with bladder training in women with mixed UI. (Grade: strong recommendation, moderate-quality evidence)

Recommendation 4: ACP recommends against treatment with systemic pharmacologic therapy for stress UI. (Grade: strong recommendation, low-quality evidence)

Recommendation 5: ACP recommends pharmacologic treatment in women with urgency UI if bladder training was unsuccessful. Clinicians should base the choice of pharmacologic agents on tolerability, adverse effect profile, ease of use, and cost of medication. (Grade: strong recommendation, high-quality evidence)

Recommendation 6: ACP recommends weight loss and exercise for obese women with UI. (Grade: strong recommendation, moderate-quality evidence)

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Urinary incontinence (UI), the involuntary loss of urine, has a prevalence of approximately 25% in young women (aged 14 to 21 years) (1), 44% to 57% in middle-aged and postmenopausal women (aged 40 to 60 years) (2), and 75% in elderly women (aged ≥75 years) (3). However, these statistics may be underestimated because one study showed that at least half of incontinent women do not report the issue to their physicians (4). Risk factors for UI include pregnancy, pelvic floor trauma after vaginal delivery, menopause, hysterectomy, obesity, urinary tract infection, functional and/or cognitive impairment, chronic cough, and constipation (5). The effects of UI range from slightly bothersome to debilitating. Urinary incontinence also contributes to high medical spending—approximately $19.5 billion was spent in the United States in 2004—and it accounts for 6% of nursing home admissions for elderly women, costing approximately $3 billion (6).

The 2 types of UI are based on the dysfunctional mechanism: stress and urgency. However, the distinction is not always clear, particularly for older women. Stress UI is related to urethral sphincter failure associated with intra-abdominal pressure and results in the inability to retain urine when laughing, coughing, or sneezing (7). Urgency UI is the involuntary loss of urine associated with a sudden and compelling urge to void (7).

Mixed UI is a combination of stress and urgency UI. Overactive bladder is a constellation of symptoms that includes urinary urgency (with or without UI), usually accompanied by frequency, and nocturia (5).

The primary goal of treatment is to achieve or improve continence (8, 9). Clinically successful treatment has been defined as that which reduces the frequency of UI episodes by at least 50% (10). Treatments addressed in this guideline include lifestyle changes, pelvic floor muscle training (PFMT), and various approved drugs (**Table 1**) (8). Surgical treatments, available for women in whom conserva-

See also:

Summary for Patients I-34

Web-Only
Supplement
CME quiz

* This paper, written by Amir Qaseem, MD, PhD, MHA; Paul Dallas, MD; Mary Ann Forciea, MD, MS; Melissa Starkey, PhD; Thomas D. Denberg, MD, PhD; and Paul Shekelle, MD, PhD, was developed for the Clinical Guidelines Committee of the American College of Physicians. Individuals who served on the Clinical Guidelines Committee from initiation of the project until its approval were Paul Shekelle, MD, PhD (*Chair*); Michael J. Barry, MD; Roger Chou, MD; Molly Cooke, MD; Paul Dallas, MD; Thomas D. Denberg, MD, PhD; Nick Fitterman, MD; Mary Ann Forciea, MD, MS; Russell P. Harris, MD, MPH; Linda L. Humphrey, MD, MPH; Tanveer P. Mir, MD; Holger J. Schünemann, MD, PhD; J. Sanford Schwartz, MD; Donna E. Sweet, MD; and Timothy Wilt, MD, MPH. Approved by the ACP Board of Regents on 25 September 2013.

Table 1. **Nonpharmacologic Treatments for UI**

Treatment	Description
PFMT	Instruction on the voluntary contraction of pelvic floor muscles (Kegel exercises)
PFMT with biofeedback using vaginal EMG	PFMT with EMG probe used to give patients visual feedback on when they are properly contracting the pelvic floor muscles
Bladder training	Behavioral therapy that includes extending the time between voiding
Continence service	Treatment program involving nurses and clinicians trained in identifying, diagnosing, and appropriately treating patients with UI

EMG = electromyography; PFMT = pelvic floor muscle training; UI = urinary incontinence.

tive therapy has failed or who have anatomical abnormalities, are not addressed in this guideline.

This guideline from the American College of Physicians (ACP) presents the available evidence on the nonsurgical (pharmacologic and nonpharmacologic) treatment of UI in women in the primary care setting. It does not fully evaluate nonsurgical treatments, such as botulinum toxin or percutaneous nerve, magnetic, or electrical stimulation, because they are not typically used by or available to primary care physicians. The target audience includes all clinicians, and the target patient population is all women with UI. This guideline is based on a systematic evidence review sponsored by the Agency for Healthcare Research and Quality (11) and an updated literature search (**Supplement**, available at www.annals.org).

Methods

This guideline is based on a systematic evidence review (11) that addressed the following key questions related to the diagnosis and nonsurgical management of UI:

1. How effective is the nonpharmacologic treatment of UI in women?

1a. How do nonpharmacologic treatments affect incontinence, severity and frequency of UI, and quality of life compared with no active treatment?

1b. How do combined methods of nonpharmacologic treatments with drugs affect incontinence, severity and frequency of UI, and quality of life compared with no active treatment or monotherapy?

1c. What is the comparative effectiveness of different nonpharmacologic treatments?

1d. What are the harms of nonpharmacologic treatments compared with no active treatment?

1e. What are the comparative harms of different nonpharmacologic treatments?

1f. Which patient characteristics, including age, type and severity of UI, baseline disease that affects UI, adherence to treatment recommendations, and comorbid conditions, can modify the effects of nonpharmacologic treatments on patient outcomes, such as continence, quality of life, and harms?

2. How effective is the pharmacologic treatment of UI in women?

2a. How do pharmacologic treatments affect continence, severity and frequency of UI, and quality of life compared with no active treatment or combined treatment methods?

2b. What is the effectiveness of pharmacologic treatments compared with each other or with nonpharmacologic treatments of UI?

2c. What are the harms of pharmacologic treatments compared with no treatment?

2d. What are the harms of pharmacologic treatments of UI compared with each other or with nonpharmacologic treatments?

2e. Which patient characteristics, including age, type and severity of UI, baseline disease that affects UI, adherence to treatment recommendations, and comorbid conditions, can modify the effects of pharmacologic treatments on patient outcomes, such as continence, quality of life, and harms?

The systematic evidence review was done by the Minnesota Evidence-based Practice Center. The literature search included English-language studies published between 1990 and December 2011 identified using MEDLINE, the Cochrane Library, Scirus, and Google Scholar as well as manual searches of reference lists from systematic reviews. Literature was updated through December 2013, focusing on treatments most relevant to primary care (see the **Supplement** for details). Data were extracted using a standardized form, and study quality was assessed according to the *Methods Guide for Effectiveness and Comparative Effectiveness Reviews* (12). This guideline focuses on treatments most relevant to primary care clinicians; the full report (11) and published article (13) contain more details.

This guideline rates the evidence and recommendations by using ACP's guideline grading system (**Table 2**). Details of the guideline development process can be found in the methods paper (14).

Diagnosis

Because most women with UI do not report it to their physicians (4), physicians should proactively ask female patients about bothersome UI symptoms as part of a routine review of systems. Clinicians should take a focused history and ask specific questions, such as the time of onset, symptoms, and frequency (4). Clinicians should also do a focused physical examination and evaluate neurologic symptoms. Asking such questions as "Do you have a problem with urinary incontinence (of your bladder) that is bothersome enough that you would like to know more about how it could be treated?" as part of a quality improvement intervention has been shown to increase appropriate care by 15% in patients aged 75 years or older (15).

Treatment

Complete continence, a clinically important improvement in UI (defined as reducing UI frequency by ≥50%), and quality of life were the primary outcomes assessed in the systematic review to evaluate the effectiveness of nonpharmacologic and pharmacologic treatments.

Nonpharmacologic Treatment

Appendix Table 1 (available at www.annals.org) summarizes nonpharmacologic treatments.

Stress UI: Nonpharmacologic Treatment

PFMT Versus No Active Treatment. High-quality evidence showed that PFMT is an effective UI treatment compared with no active treatment. Pooled data from studies that included women with stress UI (16–18) showed increased continence rates with PFMT compared with no active treatment (number needed to treat for benefit [NNT_B], 3 [95% CI, 2 to 5]). High-quality evidence showed that PFMT was more than 5 times as effective as no active treatment in improving UI (NNT_B, 2 [CI, 2 to 6]) (16, 19–23). In addition, studies reported improved quality of life (11).

PFMT With Biofeedback Using a Vaginal Electromyography Probe Versus No Active Treatment. Low-quality evidence showed that PFMT with biofeedback using a vaginal electromyography probe increased continence compared with no active treatment (16, 20). High-quality evidence showed that this treatment improved UI compared with no active treatment (NNT_B, 3 [CI, 2 to 6]) (16, 19, 20, 24).

Other Treatments. Evidence was insufficient to determine the effectiveness of vaginal cones and pessaries or of intravaginal and intraurethral devices versus no active treatment (11).

Urgency UI: Nonpharmacologic Treatment

Bladder Training Versus No Active Treatment. Low-quality evidence showed that bladder training improved UI compared with no active treatment (NNT_B, 2 [CI, 2 to 4]) (25, 26). However, evidence on bladder training for achieving complete continence was insufficient (11).

Mixed UI: Nonpharmacologic Treatment

PFMT Versus No Active Treatment. Pooled data from studies that included women with mixed UI (18, 20, 27) showed increased continence rates with PFMT compared with no active treatment.

PFMT Plus Bladder Training Versus No Active Treatment. High-quality evidence showed that PFMT combined with bladder training achieved continence (NNT_B, 6 [CI, 4 to 16]) (28–32) and improved UI (NNT_B, 3 [CI, 2 to 6]) (28, 30–32) compared with no active treatment.

Table 2. **The American College of Physicians' Guideline Grading System***

Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden or Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced With Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to determine net benefits or risks		

* Adopted from the classification developed by the GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) workgroup.

Continence Service Versus No Active Treatment. Continence service involves nurses and clinicians trained to identify, diagnose, and appropriately treat patients with UI. Moderate-quality evidence showed that this service yielded no statistically significant improvement in continence compared with no active treatment (33–35). Low-quality evidence showed no consistent statistically significant improvement in UI (35, 36).

Weight Loss and Physical Activity Versus No Active Treatment. Moderate-quality evidence indicated that weight loss and exercise improved UI in obese women (NNT_B, 4 [CI, 2 to 18]) (37, 38).

Other Treatments. Evidence was insufficient to determine the effectiveness of behavioral modification programs, a soy-enriched diet, or acupuncture for improving UI in women with mixed UI (11).

Comparative Effectiveness of Nonpharmacologic Treatments

No evidence showed that one nonpharmacologic treatment was superior to another in the various comparisons assessed for stress, urgency, or mixed UI. Further details are available in the full systematic review (11) and the **Supplement**.

Pharmacologic Treatment

Appendix Table 2 (available at www.annals.org) summarizes pharmacologic treatments.

Stress UI: Pharmacologic Treatment

Nonsystemic Estrogen Therapy Versus Placebo. Overall evidence was insufficient to determine the effectiveness of topical estrogen therapies at improving UI. Evidence showed increased continence and improved UI with vaginal estrogen formulations, but transdermal patches were associated with worsened UI. Studies used a range of estrogen applications.

Urinary incontinence improved with vaginal estrogen tablets (39) and vaginal ovules (40) compared with placebo. Vaginal estrogen tablets increased continence compared with placebo (NNT_B, 5 [CI, 3 to 12]) (39–42). An

estradiol implant did not improve UI compared with placebo (41).

Intravaginal Estriol Plus PFMT Versus Intravaginal Estriol. Low-quality evidence from 1 study showed that a combination of intravaginal estriol plus PFMT more effectively achieved continence than intravaginal estriol alone (NNT_B, 1 [CI, 1 to 2]) (43).

Duloxetine Versus Placebo. Low-quality evidence showed that continence was reduced less with duloxetine than placebo (44, 45). High-quality evidence showed that duloxetine did not statistically significantly improve UI compared with placebo (NNT_B, 13 [CI, 7 to 143]) (44, 46–49). Low-quality evidence showed that duloxetine improved quality of life (45, 49, 50). However, quality of life did not improve in women with severe stress UI or overactive bladder (46, 51).

Urgency UI: Pharmacologic Treatment With Antimuscarinics

Darifenacin Versus Placebo. High-quality evidence showed that darifenacin improved UI compared with placebo (NNT_B, 9 [CI, 6 to 18]) (52–54). Achieving complete continence was not studied as an outcome with darifenacin treatment. High-quality evidence also showed that darifenacin improved quality of life (11).

Fesoterodine Versus Placebo. Moderate-quality evidence showed that fesoterodine achieved continence more than placebo (NNT_B, 8 [CI, 6 to 11]) (55–57). High-quality evidence also showed an improvement in UI (NNT_B, 10 [CI, 7 to 18]) (56, 58–60). Low-quality evidence showed that fesoterodine also improved quality of life (11).

Oxybutynin Versus Placebo. High-quality evidence showed that oxybutynin achieved continence more than placebo (NNT_B, 9 [CI, 6 to 16]) (61–65). Moderate-quality evidence showed that this agent also improved UI (NNT_B, 6 [CI, 4 to 11]) (24, 61, 62, 64, 66–73).

Propiverine Versus Placebo. Low-quality evidence showed that propiverine achieved continence more than placebo (NNT_B, 6 [CI, 4 to 12]) (74, 75), and moderate-quality evidence showed that it improved UI (NNT_B, 5 [CI, 4 to 8]) (74–76) compared with placebo.

Solifenacin Versus Placebo. High-quality evidence showed that solifenacin achieved continence more than placebo (NNT_B, 9 [CI, 6 to 17]) (77–81), and low-quality evidence indicated that it resolved UI compared with placebo (NNT_B, 6 [CI, 4 to 10]) (81, 82). Low-quality evidence from 1 study showed that higher doses of solifenacin (10 mg/d vs. 5 mg/d) did not decrease the frequency of UI episodes and were associated with increased risk for adverse effects (83).

Tolterodine Versus Placebo. High-quality evidence showed that tolterodine achieved continence (NNT_B, 12 [CI, 8 to 25]) (55, 56, 84, 85) and improved UI (NNT_B, 10 [CI, 7 to 24]) (55, 56, 59, 86–90) more than placebo. Low-quality evidence showed that tolterodine improved quality of life (11).

Trospium Versus Placebo. High-quality evidence showed that trospium achieved continence more than placebo (NNT_B, 9 [CI, 7 to 12]) (91–94). Low-quality evidence did not show a statistically significant improvement in UI compared with placebo (94, 95). Individual studies showed that trospium improved quality of life (11).

Urgency UI: Pharmacologic Treatment With β_3-Adrenoceptor Agonists

Mirabegron Versus Placebo. Moderate-quality evidence showed that mirabegron achieved continence more than placebo (NNT_B, 12 [CI, 7 to 29]) and improved UI compared with placebo (NNT_B, 9 [CI, 6 to 17]) (96). Low-quality evidence showed that higher doses of mirabegron improved treatment satisfaction and quality of life compared with lower doses (150 mg/d vs. 100 mg/d) (97).

Solabegron Versus Placebo. Evidence was insufficient to determine the effect of solabegron on continence or improving UI, but low-quality evidence showed that it decreased the frequency of UI episodes in a dose-dependent manner (98).

Urgency UI: Other Pharmacologic Treatments

Evidence was insufficient to determine the clinical effectiveness of resiniferatoxin or nimodipine compared with placebo for treatment of UI (11).

Urgency UI: Comparative Effectiveness of Pharmacologic Treatments

Fesoterodine Versus Tolterodine. Moderate-quality evidence showed that fesoterodine achieved continence more often than tolterodine (NNT_B, 18 [CI, 11 to 52]) (55, 56, 99). High-quality evidence showed that fesoterodine improved UI more than tolterodine (NNT_B, 36 [CI, 17 to 1000]) (55, 56, 59, 90).

Oxybutynin Versus Tolterodine. Low-quality evidence showed no difference between oxybutynin and tolterodine for achieving continence (100). Moderate-quality evidence showed no difference for improving UI (66, 68, 100, 101).

Tolterodine Versus Trospium. Low-quality evidence from 1 study showed that tolterodine and trospium were similarly effective at treating urgency UI (100).

Solifenacin Versus Tolterodine. Evidence was insufficient to compare solifenacin with tolterodine for effects on continence or improvement of UI (11).

Trospium Versus Oxybutynin. Low-quality evidence showed no differences between trospium and oxybutynin for effects on continence or improvement of UI (100).

Other Comparisons. Evidence was insufficient to determine the comparative effectiveness on continence or improvement of UI for darifenacin, propiverine, solifenacin, or flavoxate versus oxybutynin; solifenacin versus darifenacin; or tolterodine or solifenacin versus propiverine (11).

Comparative Effectiveness of Pharmacologic Versus Nonpharmacologic Treatments

Low-quality evidence from 1 study showed that PFMT plus bladder training improved UI more than tolterodine alone (102).

Role of Patient Characteristics on Outcomes of Pharmacologic Treatments

Age. Moderate-quality evidence showed that age did not modify clinical outcomes associated with pharmacologic treatment (11). High-quality evidence showed that trospium, oxybutynin, and darifenacin effectively improved UI and quality of life in older women (52, 71, 92). High-quality evidence also showed that solifenacin achieved continence more often than placebo, regardless of age (77).

Race. Evidence was inconclusive about differences among various racial groups.

Baseline Frequency of UI. Low-quality evidence showed that the baseline frequency of UI was not associated with statistically significantly different clinical outcomes for any drugs examined (11). However, women with more frequent UI episodes had slightly greater benefits with active pharmacologic treatment than placebo (103, 104).

Prior Treatment Response. High-quality evidence showed that solifenacin achieved continence more than placebo regardless of the response to previous treatments; a larger dose did not improve an initially poor response (77).

Concomitant Treatments. Moderate-quality evidence indicated that trospium reduced the number of urgency UI episodes regardless of whether the patient was receiving other drugs. Patients receiving 7 or more concomitant medications had more adverse effects than those receiving fewer than 7 (105).

Obesity. Evidence did not show any difference in effectiveness of trospium in achieving continence in obese or nonobese patients (106).

Adverse Effects

Nonpharmacologic Treatments

The risk for adverse effects associated with nonpharmacologic treatments was low.

Pharmacologic Treatments

Appendix Table 2 summarizes the adverse effects associated with pharmacologic treatments, which were similar within drug classes. The most commonly reported adverse effects associated with antimuscarinics included dry mouth, constipation, and blurred vision. Evidence showed that fesoterodine (high-quality; number needed to treat for harm [NNT_H], 7 [CI, 5 to 9]) (56, 57, 60, 107, 108), solifenacin (high-quality; NN_H, 6 [CI, 4 to 12]) (78, 79, 82, 109), tolterodine (high-quality; NNT_H, 12 [CI, 8 to 21]) (56, 66, 85, 107, 109–116), and trospium (moderate-quality; NNT_H, 8 [CI, 6 to 11]) (91–93, 112, 117) had higher rates of adverse effects than placebo. Moderate-quality evidence showed that adverse effects, including dry mouth and headache, were more common with fesoterodine than with tolterodine (NNT_H, 11 [CI, 8 to 17]) (99). Dry mouth and insomnia were more frequently reported for oxybutynin than for tolterodine (100).

Dizziness was more frequently reported for trospium, and dry mouth and insomnia were more frequently reported for oxybutynin (100). Tolterodine has also been associated with increased risk for hallucinations (118). Nasopharyngitis and gastrointestinal disorders were more frequent with mirabegron than placebo (96, 97).

Discontinuation of treatment due to adverse effects was common. Evidence showed that discontinuation due to adverse effects was higher for fesoterodine (high-quality; NNT_H, 33 [CI, 18 to 102]) (55, 56, 58–60, 119), oxybutynin (high-quality; NNT_H, 16 [CI, 8 to 86]) (65–68, 72, 120), propiverine (low-quality; NNT_H, 29 [CI, 16 to 77]) (75, 121), solifenacin (high-quality; NNT_H, 78 [CI, 39 to 823]) (77–80, 82, 121–123), and trospium (high-quality; NNT_H, 56 [CI, 30 to 228]) (92–94, 117, 124) than for placebo. High-quality evidence showed no statistically significant difference in treatment discontinuation rates due to adverse effects between darifenacin (52–54, 125–127) or tolterodine and placebo (55, 56, 59, 66, 87, 107, 110, 111, 113, 115, 123, 128, 129).

Discontinuation due to adverse effects was higher with fesoterodine than tolterodine (moderate-quality; NNT_H, 58 [CI, 33 to 206]) (55, 56, 59, 107) and with oxybutynin than tolterodine (high-quality; NNT_H, 14 [CI, 7 to 145]) (67, 68, 101, 110, 130–135). Discontinuation of treatment due to adverse effects did not differ between solifenacin and tolterodine (moderate-quality) (123, 136–138) or between trospium and oxybutynin (low-quality) (100, 139, 140).

Summary

Nonpharmacologic therapies were effective at managing UI, had a large magnitude of benefit for increasing continence rates, and were associated with a low risk for adverse effects. Pelvic floor muscle training alone and in combination with bladder training or biofeedback and weight loss with exercise for obese women were effective at achieving continence and improving UI. Evidence was insufficient to compare nonpharmacologic therapies with one another or with pharmacologic therapies; head-to-head comparisons would be useful.

Pharmacologic therapies were effective and equally efficacious at managing urgency UI and had a moderate magnitude of benefit in achieving continence rates but were associated with adverse effects. In addition, evidence showed that some patients were likely to discontinue pharmacologic treatment because of adverse effects. Solifenacin was associated with the lowest risk for discontinuation due to adverse effects, whereas oxybutynin was associated with the highest risk.

Only darifenacin and tolterodine had risks for discontinuation due to adverse effects similar to placebo. Evi-

Figure. **Summary of the American College of Physicians guideline on nonsurgical management of urinary incontinence in women.**

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SUMMARY OF THE AMERICAN COLLEGE OF PHYSICIANS GUIDELINE ON NONSURGICAL MANAGEMENT OF URINARY INCONTINENCE IN WOMEN

Disease/Condition	UI
Target Audience	Internists, family physicians, and other clinicians
Target Patient Population	Women with UI
Interventions Evaluated	Nonpharmacologic: PFMT, bladder training, vaginal cones, medical devices, continence services, and weight loss and physical activity Pharmacologic: Antimuscarinics: Darifenacin, fesoterodine, oxybutynin, propiverine, solifenacin, tolterodine, trospium β_3-Adrenoceptor agonists: Mirabegron and solabegron Other: Duloxetine and estrogen
Outcomes Evaluated	Continence, improvement in UI, quality of life, and adverse effects
Benefits	Continence, ≥50% reduction in the frequency of UI episodes
Harms	Nonpharmacologic: Low risk for adverse effects Pharmacologic: The most commonly reported adverse effects included dry mouth, constipation, and blurred vision for antimuscarinics; nasopharyngitis and gastrointestinal disorders were associated with the β_3-adrenoceptor agonist mirabegron
Recommendations	*Recommendation 1: ACP recommends first-line treatment with PFMT in women with stress UI. (Grade: strong recommendation, high-quality evidence)* *Recommendation 2: ACP recommends bladder training in women with urgency UI. (Grade: strong recommendation, moderate-quality evidence)* *Recommendation 3: ACP recommends PFMT with bladder training in women with mixed UI. (Grade: strong recommendation, moderate-quality evidence)* *Recommendation 4: ACP recommends against treatment with systemic pharmacologic therapy for stress UI. (Grade: strong recommendation, low-quality evidence)* *Recommendation 5: ACP recommends pharmacologic treatment in women with urgency UI if bladder training was unsuccessful. Clinicians should base the choice of pharmacologic agents on tolerability, adverse effect profile, ease of use, and cost of medication. (Grade: strong recommendation, high-quality evidence)* *Recommendation 6: ACP recommends weight loss and exercise for obese women with UI. (Grade: strong recommendation, moderate-quality evidence)*
High-Value Care	UI is a common and important health care problem in women that is underreported and underdiagnosed. Clinicians should take a detailed history and ask specific questions about UI, such as the time of onset, symptoms, and frequency. Clinicians should use nonpharmacologic management for UI, such as PFMT for stress UI, bladder training for urgency UI, and PFMT with bladder training for mixed UI, because they are effective, have few adverse effects, and are cheaper than pharmacologic therapies. Although pharmacologic therapy can improve UI and provide complete continence, many patients discontinue medication because of adverse effects.
Clinical Considerations	Vulnerable populations include women aged >65 y, nursing home residents, and women receiving Medicare home care services. At least one half of women with UI do not report the issue to their physician. Pharmacologic treatment should be based on harms, because most drugs are similarly efficacious. Identifying and managing conditions that may cause UI, such as urinary tract infections; metabolic disorder; excess fluid intake; and impaired mental conditions, such as delirium, are important. Clinicians should identify whether patients are receiving medications that may cause or worsen UI.

PFMT = pelvic floor muscle training; UI = urinary incontinence.

dence was insufficient to compare most drugs with one another for safety and efficacy. Tolterodine and oxybutynin resulted in the same benefits, but tolterodine caused fewer harms.

Of note, many studies did not fully specify details of the patient populations studied, including whether they received prior treatment for UI, which could potentially influence treatment response. The NNT_B and NNT_H should be interpreted with care because of inherent limitations with statistics expressing absolute benefits or harms. The patient population, disease severity, and treatment duration are factors that influence the NNT_B and NNT_H. In addition, because these statistics are derived from the risk difference, they are ultimately an expression of a specific treatment versus a specific control (active or placebo) and should not be used to indirectly compare NNT_B and NNT_H across various treatments. See the **Figure** for a summary of the recommendations and clinical considerations.

RECOMMENDATIONS

Recommendation 1: ACP recommends first-line treatment with PFMT in women with stress UI. (Grade: strong recommendation, high-quality evidence)

Pelvic floor muscle training increased continence rates and improved UI and quality of life in women with stress UI. Nonpharmacologic therapy with PFMT should be first-line treatment for women with UI.

Recommendation 2: ACP recommends bladder training in women with urgency UI. (Grade: strong recommendation, moderate-quality evidence)

Bladder training improved UI for women with urgency UI. The addition of PFMT to bladder training did not improve continence compared with bladder training alone for urgency UI.

Recommendation 3: ACP recommends PFMT with bladder training in women with mixed UI. (Grade: strong recommendation, moderate-quality evidence)

Pelvic floor muscle training combined with bladder training improved continence and UI in women with mixed UI.

Recommendation 4: ACP recommends against treatment with systemic pharmacologic therapy for stress UI. (Grade: strong recommendation, low-quality evidence)

Treatment of stress UI with standard pharmacologic therapies used for urgency UI has not been shown to be effective. Vaginal estrogen formulations improved continence and stress UI, but transdermal estrogen patches worsened UI.

Recommendation 5: ACP recommends pharmacologic treatment in women with urgency UI if bladder training was unsuccessful. Clinicians should base the choice of pharmacologic agents on tolerability, adverse effect profile, ease of use, and cost of medication. (Grade: strong recommendation, high-quality evidence)

Pharmacologic therapies were effective and equally efficacious at managing urgency UI and had a moderate magnitude of benefit in achieving continence rates. However, they were associated with adverse effects and evidence showed that some patients were likely to discontinue pharmacologic treatment because of these effects. For urgency UI, oxybutynin, tolterodine, darifenacin, solifenacin, fesoterodine, and trospium increased continence rates and improved UI.

Evidence was insufficient to evaluate the comparative effectiveness of different drugs and to determine the long-term safety of pharmacologic treatments for UI. Patient characteristics, such as age, race, comorbid conditions, or baseline UI, did not affect the outcomes of the various pharmacologic medications. However, adherence to pharmacologic treatments for UI was poor.

Adverse effects were a major reason for treatment discontinuation. Clinicians and their patients should compare the risk for pharmacologic adverse effects with the severity and bothersomeness of the patient's symptoms. **Appendix Table 2** shows the quality of evidence for outcomes of continence and improvement of UI as well as the adverse effects for the various drugs.

Evidence was insufficient to evaluate the comparative effectiveness of nonpharmacologic versus pharmacologic treatments for UI, and nonpharmacologic treatment should be considered first-line therapy. Evidence showed that nonpharmacologic treatments were better than no treatment in achieving continence and improving UI with a large magnitude of effect and are associated with a low risk for adverse effects. Pharmacologic treatments are associated with adverse effects that may be intolerable and lead to discontinuation of treatment. Clinicians and patients should keep in mind the costs of treatment, especially long-term costs, when choosing treatment.

Recommendation 6: ACP recommends weight loss and exercise for obese women with UI. (Grade: strong recommendation, moderate-quality evidence)

Weight loss and exercise improved UI in obese women with no evident harms. In addition, the benefits of weight loss in obese women extend beyond improvement of UI.

ACP High-Value Care

Urinary incontinence is a common and important health care problem in women that is underreported and underdiagnosed. Clinicians should take a detailed history and ask specific questions, such as the time of onset, symptoms, and frequency. Clinicians should use nonpharmacologic management for UI, such as PFMT for stress UI, bladder training for urgency UI, and PFMT with bladder training for mixed UI, because these therapies are effective, have few adverse effects, and are cheaper than pharmacologic therapies. Although pharmacologic therapy can improve UI and provide complete continence, many patients discontinue medication because of adverse effects.

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Note: Clinical practice guidelines are "guides" only and may not apply to all patients and all clinical situations. Thus, they are not intended to override clinicians' judgment. All ACP clinical practice guidelines are considered automatically withdrawn or invalid 5 years after publication or once an update has been issued.

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Appendix Table 1. **Nonpharmacologic Treatments for UI, Pooled With Random-Effects Model**

Outcome, by Treatment	Effect on Outcome†	Studies, *n*	Patients, *n*	Relative Risk (95% CI)	Absolute Risk Difference (95% CI)	Attributable Events (95% CI), *n*	NNT_B (95% CI)	Quality of Evidence	Reference
Treatment of stress UI									
PFMT vs. no active treatment									
Continence	Improve	10	959	3.8 (2.1 to 6.8)	0.30 (0.19 to 0.41)	299 (188 to 410)	3 (2 to 5)	High	16–18, 20, 22, 23, 27, 163
Improved UI	Improve	6	510	5.44 (1.57 to 18.83)	0.41 (0.17 to 0.65)	412 (174 to 649)	2 (2 to 6)	High	16, 19–23
PFMT with biofeedback using vaginal EMG probe vs. no active treatment									
Continence	Improve/NS	2	185	11.2 (2.2 to 56.4)	0.49 (−0.10 to 1.08)	NA	NA	Low	16, 20
Improved UI	Improve	4	383	3.93 (1.00 to 15.49)	0.39 (0.17 to 0.61)	390 (170 to 610)	3 (2 to 6)	High	16, 19, 20, 24
Treatment of urgency UI									
Bladder training vs. no active treatment									
Improved UI	Improve	2	283	3.22 (2.25 to 4.60)	0.43 (0.28 to 0.59)	430 (275 to 585)	2 (2 to 4)	Low	25, 26
Treatment of mixed UI									
PFMT combined with bladder training vs. no active treatment									
Continence	Improve	5	1369	3.8 (1.5 to 9.3)	0.17 (0.06 to 0.27)	166 (63 to 268)	6 (4 to 16)	High	28–32
Improved UI	Improve	4	1171	4.13 (1.58 to 10.78)	0.39 (0.17 to 0.60)	387 (171 to 603)	3 (2 to 6)	High	28, 29, 31, 32
Continence services implemented by specialized health care providers vs. no active treatment									
Continence	Improve/NS	3	3939	1.6 (1.1 to 2.3)	0.30 (−0.01 to 0.60)	NA	NA	Moderate	33–35
Improved UI	Improve/NS	2	4038	1.33 (1.06 to 1.68)	0.20 (−0.01 to 0.41)	NA	NA	Low	35, 36
Weight loss vs. no active treatment									
Improved UI	Improve	2	386	2.17 (1.26 to 3.76)	0.27 (0.06 to 0.50)	273 (57 to 490)	4 (2 to 18)	Moderate	37, 38
Comparative effectiveness of treatments for stress UI									
Supervised vs. self-administered PFMT									
Continence	NS	4	300	1.92 (0.87 to 4.23)	0.20 (−0.03 to 0.43)	NA	NA	High	141–145
Improved UI	NS	4	283	1.51 (0.85 to 2.67)	0.14 (–0.05 to 0.32)	NA	NA	Moderate	141, 146–14
PFMT with biofeedback using vaginal EMG probe vs. PFMT									
Continence	NS	6	542	1.27 (0.88 to 1.85)	0.08 (–0.03 to 0.19)	NA	NA	High	143, 149–153
PFMT vs. vaginal cones									
Continence	NS	3	320	0.78 (0.58 to 1.06)	−0.11 (−0.26 to 0.04)	NA	NA	Moderate	21, 27, 154
Improved UI	NS	4	440	1.02 (0.91 to 1.14)	0.01 (−0.08 to 0.09)	NA	NA	Moderate	21, 27, 154, 155
Comparative effectiveness of treatments for urgency UI									
PFMT combined with bladder training vs. bladder training									
Continence	NS	2	271	1 (0.4 to 2.8)	0.001 (−0.2 to 0.2)	NA	NA	High	156, 157

EMG = electromyography; NA = not available; NNT_B = number needed to treat for benefit; NS = no significant difference based on relative and absolute risk; PFMT = pelvic floor muscle training; UI = urinary incontinence. Clinically important improvement in UI was defined as a ≥50% reduction in UI frequency.

† Adapted from reference 11. Relative risk/absolute risk where noted. "Improve" signifies that the treatment provided benefit vs. the comparator.

Appendix Table 2. **Pharmacologic Treatments for UI**

Outcome, by Treatment*	Effect on Outcome†	Studies, *n*	Patients, *n*	Relative Risk (95% CI)	Absolute Risk Difference (95% CI)	Attributable Events (95% CI), *n*	NNT_B/NNT_H (95% CI)	Adverse Effects	Quality of Evidence	Reference
Treatment of stress UI										
Duloxetine vs. placebo								Nausea, somnolence, insomnia, dizziness, headache, fatigue, diarrhea, constipation		
Continence	Worsen/NS	2	736	0.92 (0.86 to 0.99)	−0.03 (−0.12 to 0.06)	NA	NA		Low	44, 45
Improved UI	Improve/NS	4	1138	1.68 (0.94 to 3.00)	0.08 (0.01 to 0.14)	75 (7 to 142)	13 (7 to 143)		High	44, 46–49
Discontinuation due to adverse effects	Worsen	9	3252	4.40 (3.24 to 5.86)	0.13 (0.06 to 0.19)	129 (64 to 193)	8 (5 to 16)		High	44–46, 48, 50, 158–161
Intravaginal estriol plus PFMT vs. intravaginal estriol								NA		
Continence	Improve	1	206	8.1 (4.5 to 14.7)	0.69 (0.59 to 0.79)	NA	1 (1 to 2)		Low	43
Treatment of urgency UI										
Antimuscarinics										
Darifenacin vs. placebo								Constipation, dry mouth, dyspepsia, headache		
Improved UI	Improve	3	1011	1.3 (1.2 to 1.5)	0.12 (0.06 to 0.17)	117 (57 to 177)	9 (6 to 18)		High	52–54
Discontinuation due to adverse effects	NS	7	3138	1.2 (0.8 to 1.8)	0.00 (−0.01 to 0.02)	NA	NA		High	52–54, 125–127
Discontinuation due to failure	NS	4	1280	0.6 (0.2 to 1.7)	−0.01 (−0.02 to 0.01)	NA	NA		Moderate	53, 126, 127
Fesoterodine vs. placebo								Dry mouth, constipation, abdominal pain		
Continence	Improve	3	3110	1.5 (1.1 to 1.9)	0.13 (0.09 to 0.17)	132 (90 to 174)	8 (6 to 11)		Moderate	55–57
Improved UI	Improve	2	1896	1.3 (1.2 to 1.5)	0.10 (0.06 to 0.15)	100 (56 to 145)	10 (7 to 18)		High	56, 58–60
Adverse events	Worsen	5	4790	1.4 (1.2 to 1.6)	0.15 (0.11 to 0.19)	149 (112 to 185)	7 (5 to 9)		High	56, 60, 107, 108
Discontinuation due to adverse effects	Improve	4	4433	2.0 (1.3 to 3.1)	0.03 (0.01 to 0.06)	31 (10 to 56)	33 (18 to 102)		High	55, 56, 58–60, 119
Discontinuation due to failure	NS	2	1896	0.6 (0.2 to 2.5)	−0.01 (−0.03 to 0.02)	NA	NA		Moderate	56, 58, 60, 162
Oxybutynin vs. placebo								Dry mouth, constipation, dyspepsia		
Continence	Improve	4	992	1.7 (1.3 to 2.1)	0.11 (0.06 to 0.16)	114 (64 to 163)	9 (6 to 16)		High	61–65
Improved UI	Improve	9	1244	1.5 (1.2 to 1.9)	0.17 (0.10 to 0.24)	167 (95 to 240)	6 (4 to 11)		Moderate	24, 61, 62, 64, 66–73
Discontinuation due to adverse effects	Worsen	5	1483	1.7 (1.1 to 2.5)	0.06 (0.01 to 0.13)	63 (12 to 127)	16 (8 to 86)		High	65–68, 72, 120
Propiverine vs. placebo								Blurred vision, constipation, dizziness, dry mouth, headache		
Continence	Improve	2	691	1.4 (1.2 to 1.7)	0.16 (0.09 to 0.24)	163 (86 to 239)	6 (4 to 12)		Low	74, 75
Improved UI	Improve	3	985	1.6 (1.3 to 2.0)	0.19 (0.13 to 0.25)	192 (132 to 252)	5 (4 to 8)		Moderate	74–76
Discontinuation due to adverse effects	Worsen	2	1401	2.6 (1.4 to 5.0)	0.03 (0.01 to 0.06)	34 (13 to 61)	29 (16 to 77)		Low	75, 121

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Appendix Table 2—**Continued**

Outcome, by Treatment*	Effect on Outcome†	Studies, *n*	Patients, *n*	Relative Risk (95% CI)	Absolute Risk Difference (95% CI)	Attributable Events (95% CI), *n*	NNT_B/NNT_H (95% CI)	Adverse Effects	Quality of Evidence	Reference
Solifenacin vs. placebo								Dry mouth, blurred vision, constipation		
Continence	Improve	5	6304	1.5 (1.4 to 1.6)	0.11 (0.06 to 0.16)	107 (58 to 156)	9 (6 to 17)		High	77–81
Improved UI	Improve	2	1507	1.5 (1.0 to 2.1)	0.18 (0.10 to 0.26)	180 (97 to 263)	6 (4 to 10)		Low	81, 82
Adverse events	Worsen	3	1713	1.7 (1.2 to 2.4)	0.18 (0.09 to 0.27)	177 (85 to 267)	6 (4 to 12)		High	78, 79, 82, 109
Discontinuation due to adverse effects	Worsen	7	9080	1.3 (1.1 to 1.7)	0.01 (0.00 to 0.03)	13 (1 to 26)	78 (39 to 823)		High	77–80, 82, 121–123
Discontinuation due to failure	NS	4	2812	1.0 (0.5 to 1.8)	0.00 (−0.01 to 0.01)	NA	NA		Moderate	78, 82, 122, 123
Tolterodine vs. placebo								Autonomic nervous system disorders, constipation, dyspepsia, abdominal pain, dry mouth		
Continence	Improve	4	3404	1.2 (1.1 to 1.4)	0.09 (0.04 to 0.13)	85 (40 to 129)	12 (8 to 25)		High	55, 56, 84, 85
Improved UI	Improve	7	6119	1.3 (1.1 to 1.4)	0.10 (0.04 to 0.15)	96 (42 to 149)	10 (7 to 24)		High	55, 56, 59, 86–90
Adverse events	Worsen	12	4162	1.2 (1.1 to 1.3)	0.08 (0.05 to 0.12)	83 (47 to 120)	12 (8 to 21)		High	56, 66, 85, 107, 109–116
Discontinuation due to adverse effects	NS	10	4466	1.0 (0.6 to 1.7)	0.01 (−0.01 to 0.03)	NA	NA		High	55, 56, 59, 66, 87, 107, 110, 111, 113, 115, 123, 128, 129
Discontinuation due to failure	NS	5	4049	0.5 (0.2 to 0.9)	−0.01 (−0.01 to 0.00)	NA	NA		High	56, 59, 87, 113, 123
Trospium vs. placebo								Dry eye, dry mouth, dry skin, constipation		
Continence	Improve	4	2677	1.7 (1.5 to 2.0)	0.11 (0.08 to 0.14)	114 (83 to 144)	9 (7 to 12)		High	91–94
Improved UI	NS	2	1176	1.1 (0.6 to 2.0)	0.08 (−0.10 to 0.25)	NA	NA		Low	94, 95
Adverse events	Worsen	5	2967	1.4 (1.2 to 1.7)	0.12 (0.09 to 0.16)	123 (88 to 159)	8 (6 to 11)		Moderate	91–93, 112, 117
Discontinuation due to adverse effects	Worsen	6	3936	1.5 (1.1 to 1.9)	0.02 (0.00 to 0.03)	18 (4 to 33)	56 (30 to 228)		High	92–94, 117, 124
β_3-Adrenoreceptor agonist Mirabegron vs. placebo								GI disorders, nasopharyngitis		
Continence	Improve	3	1425	1.2 (1.1 to 1.4)	0.09 (0.03 to 0.14)	NA	12 (7 to 29)		Moderate	96
Improved UI	Improve	3	1425	1.2 (1.1 to 1.3)	0.11 (0.06 to 0.16)	NA	9 (6 to 17)		Moderate	96
Discontinuation due to adverse effects	NS	1	131	3.0 (0.3 to 28.5)	0.03 (−0.03 to 0.09)	NA	NA		Low	97

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Appendix Table 2—**Continued**

Outcome, by Treatment*	Effect on Outcome†	Studies, *n*	Patients, *n*	Relative Risk (95% CI)	Absolute Risk Difference (95% CI)	Attributable Events (95% CI), *n*	NNT_B/NNT_H (95% CI)	Adverse Effects	Quality of Evidence	Reference
Comparative effectiveness of antimuscarinics for pharmacologic treatment of urgency UI										
Fesoterodine vs. tolterodine								Dry mouth, headache, and UTI were more common with fesoterodine than tolterodine		
Continence	Improve	2	2756	1.10 (1.04 to 1.16)	0.06 (0.02 to 0.09)	56 (19 to 92)	18 (11 to 52)		Moderate	55, 56, 99
Improved UI	Improve	3	4425	1.06 (1 to 1.2)	0.03 (0.00 to 0.06)	28 (1 to 57)	36 (17 to 1000)		High	55, 56, 59, 90
Discontinuation due to adverse effects	Worsen	4	4440	1.54 (1.21 to 1.97)	0.02 (0.01 to 0.03)	17 (5 to 31)	58 (33 to 206)		Moderate	55, 56, 59, 107
Oxybutynin vs. tolterodine								Dry mouth, asthenia, autonomic nervous system disorder, GI disorders, dyspepsia, nausea, pain, palpitations, rhinitis, and UTI were more common with oxybutynin than tolterodine		
Improved UI	NS	3	947	1.11 (0.94 to 1.31)	0.05 (−0.03 to 0.13)	NA	NA		Moderate	66, 68, 101
Discontinuation due to adverse effects	Worsen	6	2323	1.9 (1.1 to 3.3)	0.07 (0.01 to 0.15)	72 (7 to 154)	14 (7 to 145)		High	67, 68, 101, 110, 130–135
Solifenacin vs. tolterodine								Dry mouth and constipation were more common with solifenacin than tolterodine; blurred vision was more common with tolterodine than solifenacin		
Discontinuation due to adverse effects	NS	3	2755	1.28 (0.86 to 1.91)	0.01 (0.00 to 0.03)	NA	NA		Moderate	123, 136–138
Trospium vs. oxybutynin								Dry mouth was more common with oxybutynin than trospium		
Discontinuation due to adverse effects	NS	2	2015	0.75 (0.52 to 1.1)	0.00 (−0.03 to 0.05)	NA	NA		Low	139, 140

GI = gastrointestinal; NA = not available; NNT_B = number needed to treat for benefit; NNT_H = number needed to treat for harm; NS = no significant difference based on relative and absolute risk; PFMT = pelvic floor muscle training; UI = urinary incontinence; UTI = urinary tract infection.

* Clinically important improvement in UI was defined as a ≥50% reduction in UI frequency.

† Adapted from reference 11. Relative risk/absolute risk where noted. "Improve" signifies that the treatment provided benefit versus the comparator. "Worsen" signifies that the treatment resulted in harm versus the comparator.