Screening for Urinary Incontinence

Women's Preventive Services Initiative Evidence Update November 1, 2023

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CURRENT WPSI RECOMMENDATION

Clinical Recommendations (2018)[1]

The Women's Preventive Services Initiative recommends screening women for urinary incontinence annually. Screening should ideally assess whether women experience urinary incontinence and whether it impacts their activities and quality of life. The Women's Preventive Services Initiative recommends referring women for further evaluation and treatment if indicated.

Implementation Considerations

The Women's Preventive Services Initiative recommends screening women for urinary incontinence as a preventive service. Factors associated with an increased risk for urinary incontinence include increasing parity, advancing age, and obesity; however, these factors should not be used to limit screening. Several screening tools demonstrate fair to high accuracy in identifying urinary incontinence in women. Although minimum screening intervals are unknown, given the prevalence of urinary incontinence, the fact that many women do not volunteer symptoms, and the multiple, frequently-changing risk factors associated with incontinence, it is reasonable to conduct annually.

EVIDENCE SUMMARY

New Evidence

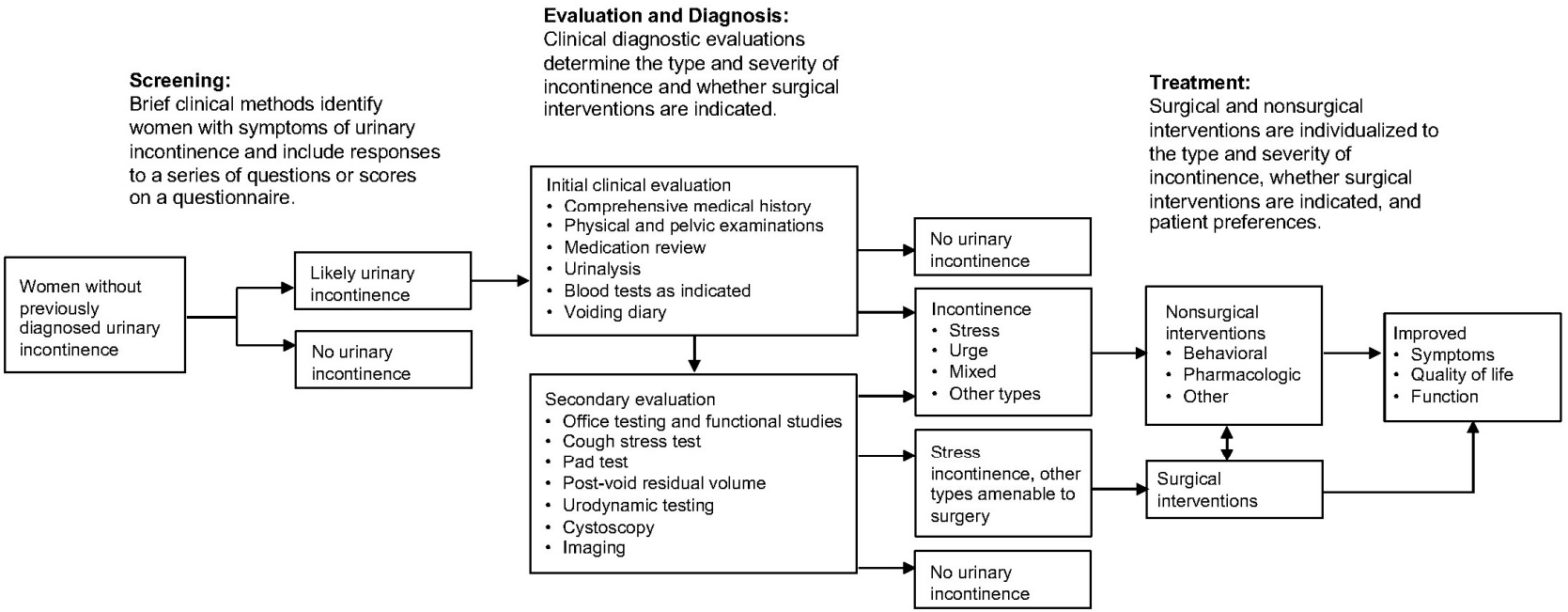
New evidence published since the previous Women's Preventive Services Initiative (WPSI) recommendation is summarized in **Table 1**.

Table 1. New Evidence Since the 2018 WPSI Recommendation

Effectiveness of screening
• No new studies.
Accuracy of screening methods in screening populations
• 1 observational study from Australia was consistent with prior studies demonstrating that diagnostic methods for assessing UI symptoms are accurate.
Adverse effects of screening methods
• No new studies.
***Contextual*: Effectiveness and harms of newer treatments**
• A 2019 systematic review of non-surgical (pharmacologic and non-pharmacologic) treatment of UI in women demonstrated the effectiveness of behavioral therapy alone or in combination with other interventions versus pharmacologic treatment alone. • A 2022 review that included 4 studies of vaginal laser therapy for SUI demonstrated short-term improvement (4- to 12-week follow-up) in SUI symptoms, although its long-term effect on symptoms was unclear. • A systematic review of 7 trials of telehealth interventions demonstrated that interventions that included education or pelvic floor muscle training were effectively delivered in person or via telehealth. • A 2019 systematic review updated evidence on harms of non-surgical treatments. Consistent with the prior WPSI review, results demonstrated rare adverse events associated with behavioral therapies or neuromodulation (low strength evidence); increased risk of erosion or voiding dysfunction with periurethral bulking agents (moderate strength evidence); and side effects associated with pharmacologic agents including alpha agonists and anticholinergic medications (high strength evidence). Botox therapy was associated with increased UTI risk and voiding dysfunction.

Abbreviations: SUI=stress urinary incontinence; UI=urinary incontinence; UTI= urinary tract infection; WPSI=Women's Preventive Services Initiative

Clinical Pathway



Current Recommendations

The WPSI currently recommends urinary incontinence screening in women annually.[2] The WPSI is the only guideline group recommending this preventive service. The U.S. Preventive Services Task Force (USPSTF) currently does not have a recommendation on screening women for urinary incontinence. Current clinical recommendations from other organizations address components of the diagnostic evaluation (**Table 2**).

Table 2. Urinary Incontinence Screening Recommendations of Professional Organizations

Organization	Recommendation
American Urological Association (AUA)[3]	• The updated guideline is aimed at healthy females with minimal or no prolapse desiring surgical therapy for treatment of SUI or stress-predominant mixed urinary incontinence. Other patients may have factors that affect treatment options and outcomes. • The evaluation should include: focused history, including assessment of bother, focused physical examination, including a pelvic examination, objective demonstration of stress urinary incontinence, assessment of post void residual urine volume, and urinalysis. • Physicians should perform further testing in those with the following: an inability to make a definitive diagnosis based on symptoms and the initial evaluation, inability to demonstrate stress urinary incontinence, known or suspected neurogenic lower urinary tract dysfunction, abnormal urinalysis such as unexplained hematuria or pyuria, urgency-predominant mixed urinary incontinence, elevated postvoid residual urine volume per clinical judgement, high grade pelvic organ prolapse (stage 3 or higher) if stress urinary incontinence not demonstrated by pelvic organ prolapse reduction, evidence of significant voiding dysfunction. • Physicians may perform further testing in those with the following: concomitant overactive bladder symptoms, failure of prior anti-incontinence surgery, prior pelvic organ prolapse surgery. • Physicians should not perform cystoscopy unless there is a concern for urinary tract abnormalities. • Physicians may omit urodynamic testing when stress urinary incontinence is clearly demonstrated.
American Congress of Obstetricians and Gynecologists (ACOG) and American Urogynecologic Society (AUGS)[4a]	Recommendation addresses preoperative evaluation: the basic office evaluation, including normal post void residual urine volume, negative urinalysis result, and positive cough stress test result, is not inferior to urodynamic testing in women with stress-predominant urinary incontinence undergoing anti-incontinence surgery.

Organization	Recommendation
European Association of Urology (EAU)[5,6]	• Take a complete medical history including symptoms and comorbidity and perform a focused physical examination. • Use a validated and appropriate questionnaire as part of standardized assessment. • Use voiding diary to evaluate co-existing storage and voiding dysfunction for at least 3 days. • Urinalysis, treat a symptomatic urinary tract infection appropriately; do not treat asymptomatic bacteriuria in elderly patients to improve urinary incontinence. • Ultrasound to measure post-voiding residual. • Measure post-voiding residual in patients with voiding dysfunction and with complicated urinary incontinence. • Do not routinely do urodynamic testing for uncomplicated stress urinary incontinence. • When performing pad testing, use a standardized duration and activity protocol.
Canadian Urological Association (CUA)[7]	The evaluation should be systematic and include: history, medical history, review of systems, social history, physical examination, investigations and treatment expectations.

Abbreviations: ACOG=American Congress of Obstetricians and Gynecologists; AUA=American Urological Association; AUGS=American Urogynecologic Society; EAU=European Association of Urology

Background

Urinary incontinence is the involuntary loss of urine[8] and is characterized by different types.[9] Stress incontinence is the inability to retain urine during physical exertion or activities that increase intraabdominal pressure, such as coughing or sneezing, and results from impaired sphincter function.[9] Urge incontinence is associated with the sensation of a sudden urge to void and usually results from contraction, over activity, or dysfunction of the detrusor muscle resulting in a rise in bladder pressure.[9] The term "overactive bladder" refers to urinary urgency with or without incontinence, usually accompanied by frequency and nighttime voiding.[9] Mixed urinary incontinence includes both stress and urge incontinence. Urinary incontinence adversely affects women's health through increased risks for urinary tract infections, skin ulceration, falls, and fractures.[10] It interferes with work and social activities, sexual function, quality of life, and independence.[11]

Approximately 25% of reproductive age women,[12] 44% to 57% of middle-aged and postmenopausal women,[13] and 75% of older women experience some involuntary urine loss.[14] Stress incontinence is more common in younger women with pelvic floor trauma and uterine prolapse related to previous vaginal delivery.[15] Urgency and mixed incontinence are more common in older women in association with overactive bladder.[8,15] Rates are higher for women with specific risk factors, particularly obesity[16,17] and previous vaginal delivery,[18] while age alone may not be an independent risk factor when considering other comorbid conditions.[19]

Urinary incontinence is infrequently addressed during routine health care despite its high prevalence and associated symptoms.[20] Women may be reluctant to discuss incontinence because of embarrassment,[21] social stigma, normalization of symptoms, lack of knowledge about treatment options,[22] or concerns about surgery. In addition, most clinicians do not routinely inquire about incontinence, and the condition may only reach their attention if the woman seeks help.[23] Of women

who ultimately seek medical attention, 30% are not evaluated for their symptoms and 80% are not treated.[20,24]

Currently, the WPSI has the only clinical practice guideline addressing screening for urinary incontinence.[1] Recommendations from other groups address diagnostic evaluation and treatment.[4,5,7,25] This evidence update evaluates evidence published since the prior WPSI review[26] on the effectiveness of screening for urinary incontinence in improving symptoms, quality of life, and function; the accuracy of screening methods; and potential harms of screening.

Update of Evidence

Methods

Targeted literature searches of the Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, and MEDLINE electronic databases (January 1, 2018 to February 7, 2023) were conducted to update the 2018 WPSI evidence review (**Appendix**). The searches addressed three key questions and two contextual questions.

Key Questions:

1. Does screening for urinary incontinence in women not previously diagnosed improve symptoms, quality-of-life, or function?
2. Among women not previously diagnosed with urinary incontinence, what is the diagnostic accuracy of methods to screen for urinary incontinence? Does accuracy vary with age, sociodemographic characteristics, cultural group, comorbid conditions, or use of additional medications?
3. What are the potential adverse effects of screening for urinary incontinence?

Contextual Questions:

1. What is the effectiveness of novel or new treatments for urinary incontinence?
2. What are the harms of treatments for urinary incontinence?

Eligible studies evaluated non-pregnant women without a current diagnosis of urinary incontinence. Studies of screening for urinary incontinence included methods currently used in U.S relevant practice settings. Studies included screening methods and approaches compared with usual care, or one method compared with another method. Outcomes of studies included clinical outcomes related to screening and subsequent treatment (KQ 1); measures of test performance (area under the receiver-operator characteristics curve [AUROC] values; sensitivity, specificity; likelihood ratios) (KQ 2); false positive/negative results, anxiety, distress, and other adverse events impacting quality of life (KQ 3). Findings related to population subgroups were specifically included when available.
Randomized controlled trials (RCTs), large (>100) prospective cohort studies, diagnostic accuracy studies, and systematic reviews were included if they met inclusion criteria. Other study designs, such as non-randomized studies of interventions and observational studies, were included when evidence from other study designs was lacking.

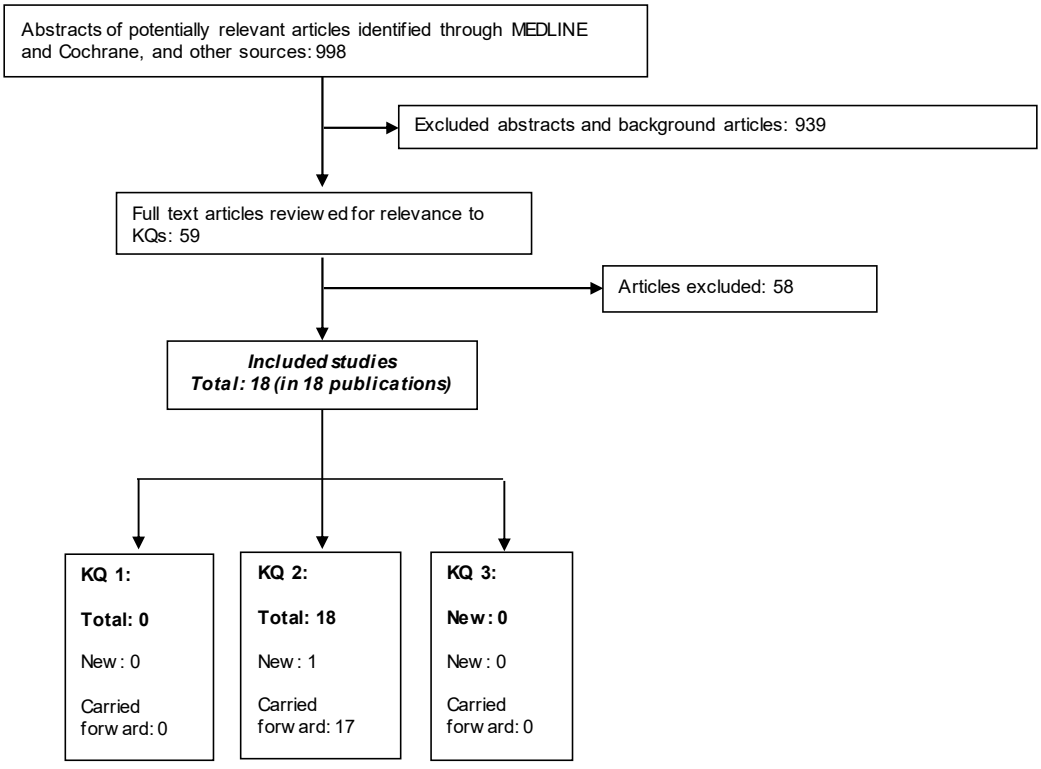
For the contextual questions on treatment (CQ 1, 2), new studies on existing treatments and studies describing new types of treatment for incontinence not addressed in the prior review were included. Studies comparing treatment against a placebo group were selected for consistency across treatment

types, and studies comparing two or more different interventions were excluded because of the heterogeneity of these data. Systematic reviews were prioritized to provide contextual summaries of relevant research, and RCTs and observational studies were cited when systematic reviews were unavailable. Treatment effectiveness outcomes include continence (voluntary bladder control), number of events attributable to active treatment, relative risk, number needed to treat, and quality of life measures. Studies of treatment harms were also considered when new data was available.

Results

A total of 998 references from electronic database searches and reference lists were reviewed. After dual review of titles and abstracts, 59 papers were selected for full-text review, of which 58 articles were excluded (see **Figure 1**). One new study was identified for KQ2 on the diagnostic accuracy of screening methods and 3 systematic reviews were identified that addressed the CQ.

Figure 1. Literature Flow Diagram



Key Question 1. Effectiveness of Screening for Urinary Incontinence – no studies

No studies evaluated the effectiveness of screening for urinary incontinence on any health outcome.

Key Questions 2. Diagnostic Accuracy of Screening Methods

One new study[27] evaluated the diagnostic accuracy of screening methods and met inclusion criteria, in addition to 17 studies of 18 screening methods identified in the previous report.[28-44] The new study is a retrospective cohort study from Australia (n=3,501) that evaluated the accuracy of a clinical prediction model to assess pelvic floor dysfunction and was developed as an aid for detection of urinary incontinence in primary care practices. The model included questions directed at assessment of stress urinary incontinence and overactive bladder. The study employed diagnostic methods to assess urinary incontinence using a model based on the 42-item Australian Pelvic Floor Questionnaire (APFQ), patient demographics, parity, and mode of delivery. Fifteen of 42 questions addressed bladder function, while the remaining questions evaluated bowel function, pelvic floor prolapse, and sexual function. The study population included symptomatic women referred for management of pelvic floor disorders compared with a comparable, asymptomatic historical cohort (n=449) and used an external validation process to evaluate the accuracy of APFQ.

The intervention was aimed at evaluating the accuracy of the self-assessment model, which included 42 predictors divided into four scored domains. Results demonstrated high accuracy of the predictive tools for stress urinary incontinence (SUI; sensitivity, 84.1% [95% CI 81.4–86.4%], specificity, 86.6% [95% CI 85–88.1%]; AUROC, 0.866 [95% CI 0.842–0.879]) and overactive bladder (OAB; sensitivity, 76.3% [95% CI 73.6–78.7%], specificity, 76.5% [95% CI 74.4–78.4%]; AUROC, 0.765 [95% CI 0.736–0.778]). In comparison, the AUROC in the prior review of studies with participants selected from the community or non-specialty clinics ranged from 0.68 to 0.85 for tools to predict SUI, and 0.82 to 0.88 for urge incontinence for patients in these settings.

For this update, no additional studies were identified that evaluated the accuracy of screening tools. **Table 3** provides a summary of the diagnostic accuracy of screening tools for urinary incontinence, including evidence from studies carried forward from the prior WPSI review.

In the prior review, seven studies enrolled participants from the community, primary care, or non-specialty clinics.[28,30,32-35,43] Of these, five studies that did not recruit participants on the basis of symptoms of incontinence are particularly applicable to population screening.[28,33-35,43] Ten studies were based in referral clinics and enrolled women with incontinence symptoms. These studies were generally designed to determine the accuracy of patient reports before urogynecologic evaluations by specialists.[29,31,36-42,44] Studies differentiated stress from urge incontinence or targeted one specific type. All the referral clinic studies met criteria for poor quality because of narrow spectra of patients, although reference standards involving urodynamic evaluations by specialists were more consistent across studies. Evaluations generally included urogynecologic physical examinations, post-void residual volume measurements, stress tests, pressure flow studies, cystometry, and cystourethrography. Accuracy measures for the instruments varied widely.

Table 3. Summary of Diagnostic Accuracy Studies of Screening Methods for Urinary Incontinence

Instrument[28,31-33,43]	Accuracy Measures for Urinary Incontinence (95% CI)			Quality Rating
	Stress	Urge	Any or Mixed	
Participants selected from the community, primary care, or other non-specialty clinics				
Australian pelvic floor questionnaire* (APFQ)	Sensitivity: 84% Specificity: 87% PPV: 73.3% NPV: 92.5% AUROC: 86.6%	NA	Sensitivity: 76% Specificity: 77% PPV: 67.1% NPV: 83.7% AUROC: 76.5%	Fair
3 Incontinence Questions (3IQ)	Sensitivity: 86% (79-90) Specificity: 60% (51-68) PLR: 2.13 (1.71-2.66) NLR: 0.24 (0.16-0.35)	Sensitivity: 75% (68-81) Specificity: 77% (69-84) PLR: 3.29 (2.39-4.51) NLR: 0.32 (0.24-0.43)	NA	Poor
Actionable Bladder Symptom Screening Tool (ABSST)	NA	Sensitivity: 79.1% Specificity: 98.2% PPV: 97.1% NPV: 86.2% AUROC: 0.958	NA	Poor
Bladder Control Self-Assessment Questionnaire (B-SAQ)	AUROC: 0.85	AUROC: 0.82	AUROC: 0.75	Fair
Incontinence Screening Questionnaire (ISQ)	NA	NA	Sensitivity: 65.52% Specificity: 80% PPV: 61.29% NPV: 82.76% PLR: 3.28 NLR: 0.43	Fair
Michigan Incontinence Symptom Index (M-ISI)	Sensitivity: 77% Specificity: 76% PPV: 43% NPV: 86% AUROC: 0.79	Sensitivity: 86% Specificity: 73% PPV: 73% NPV: 92% AUROC: 0.88	Sensitivity: 84% Specificity: 75% PPV: 75% NPV: 84% AUROC: 0.88	Good
Overactive Bladder Awareness Tool (OAB-V8)	AUROC: 0.68	AUROC: 0.82	AUROC: 0.75	Fair
Participants selected from referral clinics				
Bristol Female Lower Urinary Tract Symptoms Questionnaire (BFLUTS)	Incontinence Sensitivity: 14% Specificity: 98% Symptoms Sensitivity: 88% Specificity: 29%	Incontinence Sensitivity: 8% Specificity: 84% Symptoms Sensitivity: 81% Specificity: 12%	NA	Poor
Detrusor Instability Score (DIS)	NA	Sensitivity: 60% Specificity: 77% PPV: 82% NPV: 52%	NA	Poor

Instrument[28,31-33,43]	Accuracy Measures for Urinary Incontinence (95% CI)			Quality Rating
	Stress	Urge	Any or Mixed	
Gaudenz Incontinence Questionnaire	Sensitivity: 55.9% Specificity: 44.7% PPV: 88.2% NPV: 18.1%	Sensitivity: 61.5% Specificity: 56.1% PPV: 2.8% NPV: 98.5%	NA	Poor
Questionnaire for Urinary Incontinence Diagnosis (QUID)	Sensitivity: 85% (75–91) Specificity: 71% (51–87) PPV: 90% (81–96) NPV: 61% (42–77) AUROC: 0.83 (0.74–0.92)	Sensitivity: 79% (69–86) Specificity: 79% (54–94) PPV: 95% (87–99) NPV: 43% (26–60) AUROC: 0.83 (0.75–0.92)	NA	Poor
Urogenital Distress Inventory, 6 items (QUID)	Sensitivity: 84.8% Specificity: 63.4%	Question 1 score ≥2 Sensitivity: 75.0% Specificity: 32.6% Question 2 score ≥2 Sensitivity: 83.3% Specificity: 50.0% Question 1 + 2 score ≥2 Sensitivity: 68.6% Sensitivity: 63.8%	NA	Poor

*New study

Abbreviations: 3IQ=3 Incontinence Questions; ABSST=Actionable Bladder Symptom Screening Tool; APFQ=Australian pelvic floor questionnaire; AUROC=area under the receiver-operator curve; BFLUTS=Bristol Female Lower Urinary Tract Symptoms Questionnaire; B-SAQ=Bladder Control Self-Assessment Questionnaire; CI=confidence interval; DIS=Detrusor Instability Score; ISQ=Incontinence Screening Questionnaire; M-ISI=Michigan Incontinence Symptom Index NA=not applicable; NLR=negative likelihood ratio; NPV=negative predictive value; OAB-V8=Overactive Bladder Awareness Tool; PLR=positive likelihood ratio; PPV=positive predictive value; QUID= Questionnaire for Urinary Incontinence Diagnosis

Key Question 3. Adverse Effects of Screening Methods

No studies evaluating the accuracy and adverse effects of diagnostic methods to evaluate women after screening for urinary incontinence met inclusion criteria.

Contextual Question 1. Effectiveness of Treatments for Urinary Incontinence

Three new systematic reviews provide updated results regarding the effectiveness of treatments for urinary incontinence.

Since the prior WPSI review, a 2019 systematic review provided updated evidence on non-surgical (pharmacologic and non-pharmacologic) treatment of urinary incontinence in women and evaluated the effectiveness of behavioral therapy alone or in combination with other interventions versus no treatment or with pharmacologic treatment alone.[45] The review employed a network meta-analysis, or hierarchical model, to compare treatment effectiveness and was an update to the systematic review of treatments identified for the prior WPSI 2017 review. The 2019 review included 84 trials of 14 categories of interventions and evaluated behavioral interventions, anticholinergic medications, and neuromodulation modalities, the most reported treatment types. Results demonstrated that all interventions, other than hormones and periurethral bulking agents, were more effective than no

treatment for improving at least one included urinary incontinence outcome (e.g., symptom improvement, symptom resolution, quality of life scores). Treatments were evaluated by urinary incontinence type. For SUI, behavioral therapy was more effective than either α-agonists or hormones for symptom cure or improvement; α-agonists were more effective than hormones for symptom improvement; and neuromodulation was more effective than no treatment for cure, improvement, and patient satisfaction. For urgency urinary incontinence, there was a statistically significant difference favoring behavioral therapy versus anticholinergic medication for symptom cure or improvement; neuromodulation and onabotulinum toxin A (BTX) were more effective compared with no treatment, with some evidence favoring BTX effectiveness versus neuromodulation.

A 2022 review of vaginal laser therapy for SUI included four studies.[46] SUI severity was assessed using the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form or the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire, cough test, or pad test. Results demonstrated some short-term improvement (4- to 12-week follow-up) in SUI symptoms but the long-term impact on symptoms was unclear. Values returned to baseline after 12 months in all studies.

A systematic review of seven trials evaluated the effectiveness of any form of telehealth intervention used to improve urinary incontinence symptoms compared with in person health education or urinary incontinence management.[47] Telehealth interventions included web-based, teleconsultation, telemonitoring, mobile application, telephone, text messaging, email. While the study did not evaluate the effectiveness of the interventions themselves, it addresses issues of care delivery and contributes to evidence that telehealth interventions that include education or pelvic floor muscle training can be effectively delivered in person or via telehealth.

Table 4 provides a summary of non-surgical treatments for urinary incontinence, organized by urinary incontinence type and treatment effectiveness.

Table 4. Treatments for Urinary Incontinence

UI Type	Type of Non-Surgical Treatment	Line of Treatment	Evidence Summary
Stress	Behavioral: Weight loss; Fluid reduction; Constipation management; Timed voiding	1st	Systematic reviews of trials suggest benefit: • Behavioral interventions vs. no treatment (15 trials)
	Rehabilitative: Pelvic Floor exercises; Formalized Pelvic Floor Physical Therapy (PFPT)	1st	Systematic reviews of trials suggest benefit: • PFMT vs. no treatment (4 trials)
	Mechanical: Bladder support devices (e.g., pessaries); OTC Vaginal inserts	Less evidence	• Mechanical devices: – Two systematic reviews are inconclusive. – Low enrollment, short follow-up. – Methodologically limited. • Neuromodulation vs. no treatment (7 studies) – Increased cure from incontinence • Intravesical pressure release vs. no treatment (1 study) – Increased cure from incontinence
	Medication	2nd, 3rd	• Topical estrogen (2 of 4 trials show benefit) • Transdermal estrogen: no benefit • Duloxetine: no effect • Botulinum toxin: reduction in episodes of incontinence; adverse effects include increased post-void residual and/or urinary retention • Alpha agonist vs. no treatment; no difference in cure from incontinence (2 studies)

UI Type	Type of Non-Surgical Treatment	Line of Treatment	Evidence Summary
Urge	Behavioral: Weight loss; Bladder training: timed voids, urge reduction strategies; Timed voiding	1st	Systematic reviews of intervention trials suggest benefit: • Weight loss among women with obesity & diabetes (4 trials) • Bladder training (8 trials) • Benefit or behavioral therapy vs. no treatment (15 studies) • Benefit of behavioral therapy vs. anticholinergics (3 studies) No benefit: • Reduce caffeine (3 trials) • Reduce fluid intake (3 trials) No studies: • Alcohol use, carbonated beverages, smoking, physical forces, constipation, straining.
	Rehabilitative: Pelvic Floor exercises, pelvic floor muscle training (PFMT); Formalized Pelvic Floor Physical Therapy (PFPT)	1st	Systematic reviews of intervention trials suggest benefit: • Pelvic floor muscle training (18 trials)
	Medication: Vaginal Estrogen (for postmenopausal women >60)*; Anticholinergic/ antimuscarinic medication**; ß-3 adrenergic receptor agonists; SNRI (Duloxetine)	2nd	Systematic reviews of trials suggest benefit: • Vaginal estrogen (2 trials), – Improved continence rates • Duloxetine (SNRI) – Studies show mixed results. – Improved incontinence for 75 to 140/1000 women. – Adverse effects in 129/1000 → discontinuation. • Antimuscarinic medications: – Six drugs, varied doses and formulations (Darifenacin, fesoterodine, oxybutynin, solifenacin, tolterodine, trospium). – Efficacy is comparable. – Dose response effects with fesoterodine, solifenacin. – Discontinuation rates and dose responses vary. • Benefit of anticholinergics vs. no treatment (6 studies) – Increased rates of cure from incontinence • Benefit of onabotulinum toxin A vs. no treatment (2 studies) • Benefit of onabotulinum toxin A vs. neuromodulation (1 study)

UI Type	Type of Non-Surgical Treatment	Line of Treatment	Evidence Summary
Urge, continued	Other	3rd	Systematic reviews of trials suggest benefit: • Neuromodulation vs. no treatment (7 studies) • Neuromodulation + behavioral therapy vs. no treatment (1 study)

*Not approved by the Food and Drug Administration for UI

**Avoid in older adults unless alternatives not available.

Abbreviations: PFMT=pelvic floor muscle training; PFPT=Pelvic Floor Physical Therapy; SNRI=serotonin–norepinephrine reuptake inhibitor; UI=urinary incontinence

Contextual Question 2. Adverse effects of Treatments for Urinary Incontinence

The same 2019 systematic review of non-surgical treatments also updated evidence on harms of non-surgical treatments. Consistent with findings from the prior WPSI review, results demonstrated rare adverse events associated with behavioral therapies or neuromodulation based on low strength evidence; increased risk of erosion or voiding dysfunction with periurethral bulking agents based on moderate strength evidence; and high strength evidence of side effects associated with pharmacologic agents including alpha agonists and anticholinergic medications. Botox therapy was associated with increased urinary tract infection risk and voiding dysfunction. In the 2022 review of vaginal laser therapy, local sensitivity was the only harm reported in one study. **Table 5** provides a summary of the adverse effects of treatment for urinary incontinence.

Table 5. Adverse effects of UI Treatments

Non-Surgical Treatment type	Harms
Behavioral: Weight loss; Bladder training: timed voids, urge reduction strategies; Timed voiding	• Few adverse effects reported – Weight loss: none reported – Fluid restriction: constipation, thirst, headaches. – Bladder training: none reported
Rehabilitative: Pelvic Floor exercises, pelvic floor muscle training (PFMT); Formalized Pelvic Floor Physical Therapy (PFPT)	• Pelvic floor muscle training: no harms reported
Medication: Vaginal Estrogen (for postmenopausal women >60)*; Anticholinergic/ antimuscarinic medication**; ß-3 adrenergic receptor agonists; SNRI (Duloxetine)	• High discontinuation rates overall; most common with oxybutynin, least common with solifenacin. • Side effects include: dry mouth, constipation, heartburn, urinary retention.
Surgical	• Direct injury to lower urinary tract. • General surgical complications: hemorrhage, infection, bowel injury, wound complications.

Abbreviations: PFMT=pelvic floor muscle training; PFPT=pelvic floor physical therapy; SNRI=serotonin–norepinephrine reuptake inhibitor; UI=urinary incontinence

Discussion

The findings of this evidence update of screening for urinary incontinence indicate a lack of studies evaluating the overall effectiveness or harms of screening women in the general population. One new study evaluated the diagnostic accuracy of an electronic screening questionnaire. In addition to studies identified from the prior review, 18 studies evaluated the diagnostic accuracy of 19 screening methods compared with a clinical diagnosis of incontinence or results of diagnostic tests. Of these, seven studies are more applicable to screening in the general population because they enrolled participants in primary care or non-specialty clinics. While some studies recruited participants based on incontinence symptoms, three studies were based on asymptomatic participants and demonstrated moderate to high diagnostic accuracy.

Screening for urinary incontinence generally involves asking a series of questions about symptoms, their frequency, severity, and impact on function and well-being. Screening for urinary incontinence may be accomplished through conversations with patients, rather than by attaining a threshold score on a screening questionnaire. Nonetheless, standardized screening methods can help assure that urinary incontinence is operationalized within health care systems and screening is provided routinely for all women.

The lack of effectiveness trials of screening for urinary incontinence is an important deficiency in women's health research, considering the high prevalence, health burden, and stigma of this condition. Importantly, diagnostic tools are well established. Once diagnosed, effective treatments are available in the primary care setting, including surgical referral. For example, results of the URINO (Urinary Incontinence in Older Women) trial, a cluster randomized trial from the Netherlands, provide insights into the potential benefits of screening. In the study, 31% of women aged 55 years or older in family medicine practices self-reported incontinence symptoms on two questions in a mailed questionnaire.[48] Results indicated that all women in the intervention group had diagnostic testing and 80% accepted treatment advice, whereas only 2% received treatment in the control group. At 12-month followup, more women in the intervention group had improvement in symptom severity and fewer incontinence episodes than in the control group.[49] Although this trial did not evaluate screening effectiveness specifically, it was unique in showing the effectiveness of actively engaging women with previously unidentified incontinence in diagnostic evaluation and treatment.

In 2022, the Agency for Healthcare Research and Quality (AHRQ) launched an initiative, the Improving Nonsurgical Treatment of Urinary Incontinence among Women in Primary Care (INTUIT-PC) that employs AHRQ's EvidenceNOW Model for primary care quality improvement programs.[50] These programs are aimed to "help primary care practices implement patient-centered outcomes research on effective nonsurgical interventions for urinary incontinence such as behavioral approaches, medications, and neuromodulation." First year reports provide a dissemination and implementation report, including a literature scan that assessed these approaches to improving urinary incontinence care for women in primary care settings. Importantly, this initiative is focused on treatment but does delineate the path to treatment based on screening or evaluate whether and how screening occurs. Results from this initiative are forthcoming.

Effectiveness of surgical and non-surgical treatments is well-established and has been confirmed by updated evidence, including a recent Cochrane review of reviews of conservative interventions for treating urinary incontinence in women.[51] Studies included for the contextual question added to this

evidence base by providing updated[45] data or information on new or novel[46,47] treatments for urinary incontinence.

Despite the existence of a recommendation that all women undergo routine screening for urinary incontinence, less than 40% of women are screened in primary care settings and less than half of those with symptoms seek care.[50] Among those with symptoms, 39% to 50% receive treatment. Considering these data, the importance of early identification and treatment remains paramount to facilitating efficient use of specialty referrals and community resources for urinary incontinence management.

Conclusions

No trials have evaluated the overall effectiveness and harms of screening for urinary incontinence in women. One new study of the accuracy of an electronic screening questionnaire is consistent with previous studies of 18 additional screening instruments indicating moderate to high accuracy in identifying women with stress, urge, or mixed urinary incontinence. Once a diagnosis is established, several treatments specific to the type of incontinence are effective in improving symptoms. These studies provide an indirect chain of evidence for screening for urinary incontinence, a condition with high prevalence and burden in women.

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APPENDIX A. SEARCH STRATEGY

Database: Ovid MEDLINE(R) ALL <1946 to February 07, 2023>
Search Strategy:
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1 exp Urinary Incontinence/ (35811)
2 exp Urinary Bladder, Overactive/ (5743)
3 ((urin* or stress* or urge*) and (incontin* or leak* or unabl* or inabilit*)).ti,kw. (17318)
4 or/1-3 (42423)
5 exp Women's Health/ (31581)
6 Women's Health Services/ (3952)
7 Female/ (9545271)
8 (woman or women or female).ti,ab,kw. (2066037)
9 or/5-8 (9895805)
10 Mass Screening/ (115494)
11 (screen* or asymptomatic or diagnos* or undiagnos* or undetect* or unrecogniz* or unreport* or underreport* or unacknowledg*).ti,ab,kw. (3914931)
12 Primary Health Care/ (90307)
13 ("primary care" or "general practice" or "family practice").ti,ab,kw. (180277)
14 (("well woman" or "well women" or routin* or annual* or yearly or regular) adj3 (visit* or appointment* or consult* or physical or physicals or exam or exams or examination* or checkup or check-up)).ti,ab,kw. (46457)
15 or/10-14 (4120423)
16 4 and 9 and 15 (5153)
17 (Animals/ or Models, Animal/ or Disease Models, Animal/) not Humans/ (5058157)
18 ((animal or animals or avian or bird or birds or bovine or canine or cow* or dog or dogs or cat or cats or feline or hamster* or horse* or lamb or lamb* or mouse or mice or monkey or monkeys or murine or pig or piglet* or pigs or porcine or primate* or rabbit* or rat or rats or rodent* or songbird* or veterinar*) not (human* or patient*)).ti,kf,jw. (2710415)
19 or/17-18 (5583453)
20 16 not 19 (5045)
21 limit 20 to english language (4149)
22 limit 21 to yr="2018 -Current" (923)

APPENDIX B. Inclusion/Exclusion Criteria

Category	Inclusion	Exclusion
Populations	Non-pregnant women without previously diagnosed urinary incontinence.	Women with known urinary incontinence; pregnant women.
Interventions	Screening using multiple methods feasible in U.S. clinical practice settings.	Methods not available or not feasible in U.S. clinical practice settings.
Comparisons	Methods of screening and evaluation versus usual care or versus alternative methods of screening and evaluation.	Other comparisons.
Outcomes	KQ 1: Improvement in symptoms of urinary incontinence; quality of life, and function (days of disability, limitations in activity, absences, other). KQ 2: Measures of screening test performance (sensitivity, specificity; likelihood ratios; c-stats). KQ 3: Potential adverse effects of screening (false positive/negative evaluations; anxiety; etc.)	Other outcomes not listed.
Setting	Primary care settings and those resulting from referral from primary care; settings comparable to U.S. practice.	Practice settings dissimilar than those in the U.S.
Study Design	KQ 3: Discriminatory accuracy studies KQ 1-3: RCTs, nonrandomized studies of interventions, observational studies	Other study designs
Study Quality	Good- and fair-quality studies for meta-analyses	Poor-quality studies

Abbreviations: KQ: key question; RCT: randomized controlled trial.

APPENDIX C. Evidence Table of Studies of Screening Methods

Author, Year Quality	N	Population/Setting	Baseline Symptoms	Demographics	Screening Test(s)	Definition of a Positive Test	Reference Standard
Chen, 2022[27] Fair	3501	Two cohorts of female patients >18 years: A) symptomatic women >18 years referred for management of pelvic floor disorders from a single tertiary urogynecology center in Australia (N=3032) B) historic group of asymptomatic women from a general gynecologic office (N=469)	A. Symptoms of pelvic organ prolapse, stress urinary incontinence, overactive bladder, or other gynecologic condition B. none	A vs. B Mean age: 61.2 (14) vs 59.7 (10.64) Mean BMI: 26.8 (5.46) vs 27.1 (5.47) Mean Parity: 2.3 (1.37) vs 2.7 (1.54) Race/ethnicity: NR Postmenopausal: NR	Australian Pelvic Floor Questionnaire (APFQ); 42 predictors with four individually scored domains (bladder, bowel, prolapse, sexual function), total score range 0 to 40	Bladder: 15 items on a 0 to 3 scale	Clinical diagnosis, clinical history and examination

Author, Year Quality	Sensitivity and Specificity	PPV and NPV	Other analyses
Chen, 2022[27] Fair	Stress: Sensitivity: 84.1% (95% CI, 81.4–86.4%) Specificity: 86.6% (95% CI, 85–88.1%) Any/Mixed: Sensitivity: 76.3% (95% CI 73.6–78.7%) Specificity: 76.5% (95% CI 74.4–78.4%)	Stress: PPV: 73.3% NPV: 92.5% Any/Mixed: PPV: 67.1% NPV: 83.7%	**ROC for diagnosis** Stress: 0.865 [95% CI 0.84–0.88] Any/Mixed: 0.775 (95% CI 0.74–0.78)

Abbreviations: APFQ= Australian Pelvic Floor Questionnaire; BMI= body mass index; NR= not reported; PFD=pelvic floor dysfunction;

APPENDIX D.

Quality Rating of Screening Methods Studies

Author, year	Groups similar at baseline	Spectrum	Random or consecutive sample	Eligibility criteria specified	Adequate sample size (>50)	Adequate attrition /attrition explained (ITT?)
Chen, 2022[27]	Yes	1^0 and 2^0 care clinics	Consecutive	Yes	Yes	Yes

Author, year	Reference standard				Test adequately described	Include sens/ Spec; PPV/NPV; AUC	Quality Rating
	Credible	Replicable	Interpret independently	Applied to all subjects or a random subset			
Chen, 2022[27]	Yes	Yes, validation cohort	Unclear	Yes	Yes	Yes	Fair

Diagnostic/Concordance Studies[52]

Criteria:

- Test applied to an appropriate spectrum of patients (with and without disease/condition), avoiding case-control design
- Population tested was consecutive or random
- Clear eligibility criteria described and rigorous assessment of disease/condition
- Attrition reported and minimal loss to follow-up
- Test is adequately described and reproducible
- Test was validated in a second population group
- Test is an available standard case definition

- Diagnostic test is applied to all patients
- Blinding of outcome assessors to the reference standard

Definition of ratings based on above criteria:

Good: Evaluates relevant available screening test; uses a credible reference standard; interprets reference standard independently of screening test; reliability of test assessed; has few or handles indeterminate results in a reasonable manner; includes large number (more than 500) broad-spectrum patients with and without disease; study attempts to enroll a random or consecutive sample of patients who meet inclusion criteria screening cutoffs pre-stated.

Fair: Evaluates relevant available screening test; uses reasonable although not best standard; interprets reference standard independent of screening test; moderate sample size (100 to 500 subjects) and a "medium" spectrum of patients (i.e. applicable to many settings where the diagnostic test would be applied).

Poor: Has important limitation such as: uses inappropriate reference standard; screening test improperly administered; biased ascertainment of reference standard; small sample size (<100) of very narrow selected spectrum of patients (components of study not well described).