

Screening for Urinary Incontinence (2023)

Clinical Recommendations

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

Implementation Considerations

Approximately 50% of women in the US experience urinary incontinence that can adversely affect health, quality of life, and function. Factors associated with urinary incontinence include increased parity, advancing age, and obesity; however, these factors are common and should not be used to limit screening. Because of the high prevalence of urinary incontinence in women and the potential benefits of early identification and intervention, education on urinary incontinence provided in the clinical setting may be appropriate.

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 factors associated with incontinence, it is reasonable to screen annually.

Research Recommendations

1. Studies of the incidence and prevalence of urinary incontinence, including rates of screening and treatment, based on life stages (e.g., adolescence, reproductive age, postmenopausal, pregnant, postpartum) and population characteristics (e.g., race/ethnicity, age, socioeconomic status, gender identity, occupation).
2. Studies of the effectiveness and harms of screening for urinary incontinence to improve symptoms, including studies to determine the most effective frequency and methods of screening and follow up.
3. Research on the effectiveness of behavior modification for conditions associated with urinary incontinence including alcohol and caffeine intake; constipation or straining; and weight loss for overweight or obese women, among others.
4. Research on the effectiveness of education and preventive strategies in reducing the development of urinary incontinence; identifying additional genitourinary conditions, and preventing progression of symptoms.
5. Studies of the accuracy of screening tools and effectiveness of symptom management of urinary incontinence during the early postpartum and postpartum periods.

| 2023 Requested Change Type | Revised Language | Reason Requested | Additional Notes |
|--|--|---|------------------|
| Clinical Recommendation – word removal | Screening should ideally assess whether women experience urinary incontinence and whether it impacts their activities and quality of life | Removing the word “ideally” makes the recommendation more clear for clinicians | |
| Clinical Recommendation – sentence clarification | <p>Previous: “The Women’s Preventive Services Initiative recommends referring women for further evaluation and treatment if indicated.”</p> <p>New: “If indicated, facilitating further evaluation and treatment is recommended.”</p> | The 2017 language recommended “referring”, however, the committee strongly asserts that “facilitating” is a more appropriate term to encompass both referral to outside sources, or the facilitating of further evaluation and treatment within the clinician’s office or practice. | |
| Implementation Consideration addition | New: Approximately 50% of women in the US experience urinary incontinence that can adversely affect health, quality of life, and function. | Giving context to the recommendation by stating the prevalence | |
| Implementation Consideration addition | Factors associated with urinary incontinence include increased parity, advancing age, and obesity; however, these factors are common and should not be used to limit screening. | Add that factors are “common” to address committee concerns that clinicians will use these factors to limit screening. | |
| Implementation Consideration addition | New: Because of the high prevalence of urinary incontinence in women and the potential benefits of early identification and intervention, education on urinary incontinence provided in the clinical setting may be appropriate. | Addition of universal education for urinary incontinence to decrease stigma and improve patient understanding and education | |
| Research Recommendations | Revision and addition of research recommendations, consistent with the WPSI recommendation format. | 2017 original research recommendation are not in the current WPSI Research Recommendation format. | |

| Name/Organization | Comments | Citations | File |
|--|--|---|------|
| Theresa Rohr-Kirchgraber, MD, AU/UGA Medical Partnership | As a primary care physician who cares for women throughout the life span, one of the most needed for us is useful coding and billing information. Screening for urinary incontinence is very important and something we would love to do at every opportunity. The concern is that there are so many conditions to screen for and how to utilize the time well enough that we can get all the important things done while still managing the multiple conditions and problems seen in a primary care office. Along with advocating for screening, we also must advocate for improved reimbursement. Including billing codes for screening and counseling would be helpful. | https://www.icd10data.com/search?s=screening%20for%20urinary%20incontinence | |
| Diane Newman | Can you add "c0-morbidities" to this sentence: . Studies of the incidence and prevalence of urinary incontinence, including rates of screening and treatment, based on life stages (e.g., adolescence, reproductive age, postmenopausal, pregnant, postpartum) and population characteristics (e.g., race/ethnicity, age, socioeconomic status, gender identity, occupation) | Doumouchtsis SK, Loganathan J, Pergialiotis V. The role of obesity on urinary incontinence and anal incontinence in women: a review. BJOG. 2022 Jan;129(1):162-170. doi: 10.1111/1471-0528.16848. Epub 2021 Sep 14. PMID: 34312978 Wu JM. Stress Incontinence in Women. N Engl J Med. 2021 Jun 24;384(25):2428-2436. doi: 10.1056/NEJMcp1914037. PMID: 34161707 | |

Screening for Urinary Incontinence

Women's Preventive Services
Initiative Evidence Update
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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

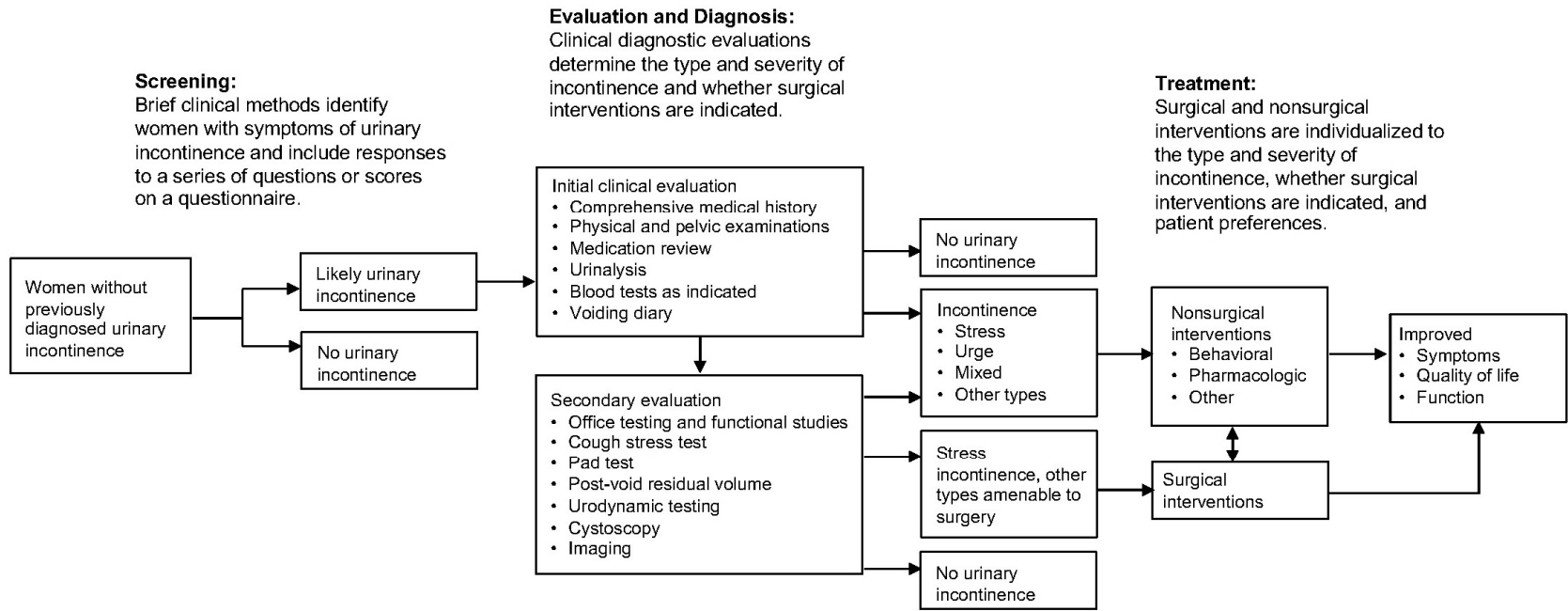
New evidence published since the previous Women’s Preventive Services Initiative (WPSI) recommendation is summarized in **Table 1**.

Table 1. New Evidence Since the 2018 WPSI Recommendation

| |
|--|
| Effectiveness of screening |
| <ul style="list-style-type: none"> No new studies. |
| Accuracy of screening methods in screening populations |
| <ul style="list-style-type: none"> 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 |
| <ul style="list-style-type: none"> No new studies. |
| Contextual: Effectiveness and harms of newer treatments |
| <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> • 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} | <ul style="list-style-type: none"> • 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 urine⁸ 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 review²⁶ 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.

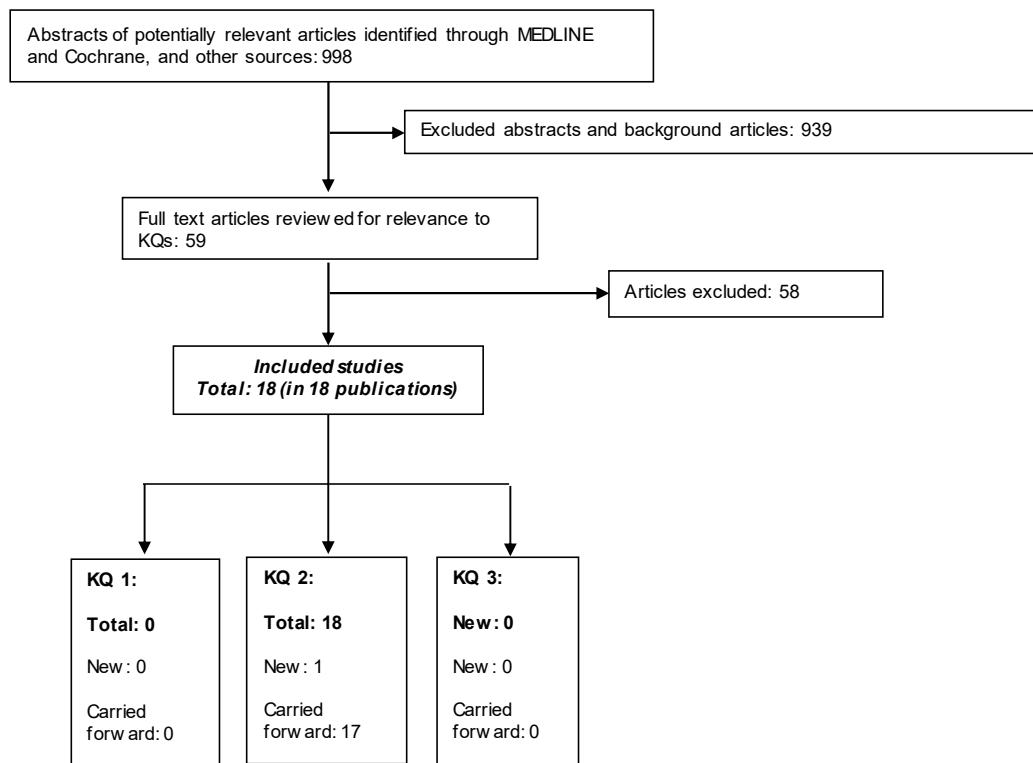
For the contextual questions on treatment (CQ 1, 2), new studies on existing treatments and studies describing new types of treatment for incontinence not addressed in the prior review were included. Studies comparing treatment against a placebo group were selected for consistency across treatment

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 study²⁷ 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% Specificity: 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 | <u>Behavioral</u> : Weight loss; Fluid reduction; Constipation management; Timed voiding | 1 st | Systematic reviews of trials suggest <u>benefit</u> : <ul style="list-style-type: none"> • Behavioral interventions vs. no treatment (15 trials) |
| | <u>Rehabilitative</u> : Pelvic Floor exercises; Formalized Pelvic Floor Physical Therapy (PFPT) | 1 st | Systematic reviews of trials suggest <u>benefit</u> : <ul style="list-style-type: none"> • PFMT vs. no treatment (4 trials) |
| | <u>Mechanical</u> : Bladder support devices (e.g., pessaries); OTC Vaginal inserts | Less evidence | <ul style="list-style-type: none"> • Mechanical devices: <ul style="list-style-type: none"> – Two systematic reviews are inconclusive. – Low enrollment, short follow-up. – Methodologically limited. • Neuromodulation vs. no treatment (7 studies) <ul style="list-style-type: none"> – Increased cure from incontinence • Intravesical pressure release vs. no treatment (1 study) <ul style="list-style-type: none"> – Increased cure from incontinence |
| | <u>Medication</u> | 2 nd , 3 rd | <ul style="list-style-type: none"> • 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 | <u>Behavioral</u> : Weight loss; Bladder training: timed voids, urge reduction strategies; Timed voiding | 1 st | Systematic reviews of intervention trials suggest <u>benefit</u> : <ul style="list-style-type: none"> • 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) <u>No benefit</u> : <ul style="list-style-type: none"> • Reduce caffeine (3 trials) • Reduce fluid intake (3 trials) <u>No studies</u> : <ul style="list-style-type: none"> • Alcohol use, carbonated beverages, smoking, physical forces, constipation, straining. |
| | <u>Rehabilitative</u> : Pelvic Floor exercises, pelvic floor muscle training (PFMT); Formalized Pelvic Floor Physical Therapy (PFPT) | 1 st | Systematic reviews of intervention trials suggest <u>benefit</u> : <ul style="list-style-type: none"> • Pelvic floor muscle training (18 trials) |
| | <u>Medication</u> : Vaginal Estrogen (for postmenopausal women >60)*; Anticholinergic/ antimuscarinic medication**; β -3 adrenergic receptor agonists; SNRI (Duloxetine) | 2 nd | Systematic reviews of trials suggest <u>benefit</u> : <ul style="list-style-type: none"> • Vaginal estrogen (2 trials), <ul style="list-style-type: none"> – Improved continence rates • Duloxetine (SNRI) <ul style="list-style-type: none"> – Studies show mixed results. – Improved incontinence for 75 to 140/1000 women. – Adverse effects in 129/1000 → discontinuation. • Antimuscarinic medications: <ul style="list-style-type: none"> – 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) <ul style="list-style-type: none"> – 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 | <u>Other</u> | 3 rd | Systematic reviews of trials suggest <u>benefit</u> : <ul style="list-style-type: none"> • 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 |
|--|--|
| <u>Behavioral</u> : Weight loss; Bladder training: timed voids, urge reduction strategies; Timed voiding | <ul style="list-style-type: none"> • Few adverse effects reported <ul style="list-style-type: none"> – Weight loss: none reported – Fluid restriction: constipation, thirst, headaches. – Bladder training: none reported |
| <u>Rehabilitative</u> : Pelvic Floor exercises, pelvic floor muscle training (PFMT); Formalized Pelvic Floor Physical Therapy (PFPT) | <ul style="list-style-type: none"> • Pelvic floor muscle training: no harms reported |
| <u>Medication</u> : Vaginal Estrogen (for postmenopausal women >60)*; Anticholinergic/ antimuscarinic medication**; β -3 adrenergic receptor agonists; SNRI (Duloxetine) | <ul style="list-style-type: none"> • High discontinuation rates overall; most common with oxybutynin, least common with solifenacin. • Side effects include: dry mouth, constipation, heartburn, urinary retention. |
| <u>Surgical</u> | <ul style="list-style-type: none"> • 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 updated⁴⁵ 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.

REFERENCES

1. Women's Preventive Services Initiative. Urinary Incontinence. <https://www.womenspreventivehealth.org/recommendations/urinary-incontinence/#:~:text=The%20Women's%20Preventive%20Services%20Initiative,activities%20and%20quality%20of%20life>. Accessed June 27, 2023.
2. O'Reilly N, Nelson HD, Conry JM, et al. Screening for Urinary Incontinence in Women: A Recommendation From the Women's Preventive Services Initiative. *Ann Intern Med*. 2018;169(5):320-8. doi: 10.7326/M18-0595. PMID: 30105360.
3. Kobashi KC, Vasavada S, Bloschichak A, et al. Updates to surgical treatment of female Stress Urinary Incontinence (SUI): AUA/SUFU Guideline (2023). *J Urol*. 2023 Jun;209(6):1091-8. doi: 10.1097/ju.0000000000003435. PMID: 37096580.
4. Urinary incontinence in women. *Female Pelvic Med Reconstr Surg*. 2015;21(6):304-14. doi: 10.1097/spv.0000000000000231. PMID: 01436319-201511000-00003.
5. Lucas MG, Bedretdinova D, Bosch JLHR, et al. Guidelines on Urinary Incontinence European Association of Urology. 2014.
6. Nambiar AK, Arlandis S, Bo K, et al. European Association of Urology Guidelines on the Diagnosis and Management of Female Non-neurogenic Lower Urinary Tract Symptoms. Part 1: Diagnostics, Overactive Bladder, Stress Urinary Incontinence, and Mixed Urinary Incontinence. *Eur Urol*. 2022 07;82(1):49-59. doi: 10.1016/j.eururo.2022.01.045. PMID: 35216856.
7. Bettez M, Tu LM, Carlson K, et al. 2012 Update: Guidelines for Adult Urinary Incontinence Collaborative Consensus Document for the Canadian Urological Association. *Can Urol Assoc J*. 2012;6(5):354-63. doi: 10.5489/cuaj.12248. PMID: PMC3478335.
8. Abrams P, Andersson KE, Birder L, et al. Fourth International Consultation on Incontinence Recommendations of the International Scientific Committee: Evaluation and treatment of urinary incontinence, pelvic organ prolapse, and fecal incontinence. *Neurourol Urodyn*. 2010;29(1):213-40. doi: 10.1002/nau.20870. PMID: 20025020.
9. Haylen BT, de Ridder D, Freeman RM, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. *Neurourology and urodynamics*. 2010;29(1):4-20. doi: 10.1002/nau.20798. PMID: 19941278.
10. Rosenberg MT, Dmochowski RR. Overactive bladder: evaluation and management in primary care. *Cleve Clin J Med*. 2005 Feb;72(2):149-56. PMID: 15757170.
11. Morrison A, Levy R. Fraction of nursing home admissions attributable to urinary incontinence. *Value Health*. 2006 Jul-Aug;9(4):272-4. doi: 10.1111/j.1524-4733.2006.00109.x. PMID: 16903997.
12. Carls C. The prevalence of stress urinary incontinence in high school and college-age female athletes in the midwest: implications for education and prevention. *Urologic nursing*. 2007 Feb;27(1):21-4, 39. PMID: 17390923.
13. Kinchen KS, Lee J, Fireman B, et al. The prevalence, burden, and treatment of urinary incontinence among women in a managed care plan. *Journal of women's health (2002)*. 2007 Apr;16(3):415-22. doi: 10.1089/jwh.2006.0122. PMID: 17439386.

14. Boyington JE, Howard DL, Carter-Edwards L, et al. Differences in resident characteristics and prevalence of urinary incontinence in nursing homes in the southeastern United States. *Nursing research*. 2007 Mar-Apr;56(2):97-107. doi: 10.1097/01.nnr.0000263969.08878.51. PMID: 17356440.
15. Shamliyan T, Wyman J, Bliss DZ, et al. Prevention of urinary and fecal incontinence in adults. Evidence report/technology assessment. 2007 Dec(161):1-379. PMID: 18457475.
16. Nygaard I, Barber MD, Burgio KL, et al. Prevalence of symptomatic pelvic floor disorders in US women. *Jama*. 2008 Sep 17;300(11):1311-6. doi: 10.1001/jama.300.11.1311. PMID: 18799443.
17. Al-Mukhtar Othman J, Akervall S, Milsom I, et al. Urinary incontinence in nulliparous women aged 25-64 years: a national survey. *Am J Obstet Gynecol*. 2017 Feb;216(2):149.e1-e11. doi: 10.1016/j.ajog.2016.09.104. PMID: 27720862.
18. Lukacz ES, Lawrence JM, Contreras R, et al. Parity, mode of delivery, and pelvic floor disorders. *Obstet Gynecol*. 2006 Jun;107(6):1253-60. doi: 10.1097/01.aog.0000218096.54169.34. PMID: 16738149.
19. Lawrence JM, Lukacz ES, Nager CW, et al. Prevalence and co-occurrence of pelvic floor disorders in community-dwelling women. *Obstet Gynecol*. 2008 Mar;111(3):678-85. doi: 10.1097/AOG.0b013e3181660c1b. PMID: 18310371.
20. Abrams P, Kelleher CJ, Kerr LA, et al. Overactive bladder significantly affects quality of life. *Am J Manag Care*. 2000 Jul;6(11 Suppl):S580-90. PMID: 11183901.
21. MacKay K, Hemmett L. Needs assessment of women with urinary incontinence in a district health authority. *The British journal of general practice : the journal of the Royal College of General Practitioners*. 2001 Oct;51(471):801-4. PMID: 11677702.
22. Davila GW, Guerette N. Current treatment options for female urinary incontinence--a review. *International journal of fertility and women's medicine*. 2004 May-Jun;49(3):102-12. PMID: 15303311.
23. Melville JL, Newton K, Fan MY, et al. Health care discussions and treatment for urinary incontinence in U.S. women. *Am J Obstet Gynecol*. 2006 Mar;194(3):729-37. doi: 10.1016/j.ajog.2005.09.011. PMID: 16522405.
24. Clement DK, Lapitan CM, Omar IM, et al. Urodynamic studies for management of urinary incontinence in children and adults. *Cochrane Database Syst Rev*. 2013(10) PMID: 00075320-100000000-02127.
25. Appell RA, Dmochowski RR, Blaivas JM, et al. Guidelines for the surgical management of female stress urinary incontinence: Update (2009). American Urological Association Education and Research Inc; 2009.
26. Nelson HD, Cantor A, Pappas M, et al. Screening for urinary incontinence in women: a systematic review for the Women's Preventive Services Initiative. *Ann Intern Med*. 2018;169(5):311-9. doi: 10.7326/M18-0225. PMID: 30105353.
27. Chen Z, Mikhail SM, Buttini M, et al. Online prediction tool for female pelvic floor dysfunction: development and validation. *Int Urogynecol J Pelvic Floor Dysfunct*. 2022 Nov;33(11):3025-33. doi: 10.1007/s00192-021-04985-7. PMID: 34618193.

28. Basra RK, Cortes E, Khullar V, et al. A comparison study of two lower urinary tract symptoms screening tools in clinical practice: the B-SAQ and OAB-V8 questionnaires. *J Obstet Gynaecol*. 2012 Oct;32(7):666-71. doi: 10.3109/01443615.2012.696158. PMID: 22943714.
29. Bergman A, Bader K. Reliability of the patient's history in the diagnosis of urinary incontinence. *Int J Gynaecol Obstet*. 1990 Jul;32(3):255-9. PMID: 1972118.
30. Borup K, Hvidman L, Nielsen JB, et al. Validity of a self-administered questionnaire, with reference to a clinical stress urinary incontinence test. *Scand J Urol Nephrol*. 2008;42(2):148-53. doi: 10.1080/00365590701570839. PMID: 17853006.
31. Bradley CS, Rovner ES, Morgan MA, et al. A new questionnaire for urinary incontinence diagnosis in women: development and testing. *Am J Obstet Gynecol*. 2005 Jan;192(1):66-73. doi: 10.1016/j.ajog.2004.07.037. PMID: 15672005.
32. Brown JS, Bradley CS, Subak LL, et al. The sensitivity and specificity of a simple test to distinguish between urge and stress urinary incontinence. *Ann Intern Med*. 2006 May 16;144(10):715-23. doi: 10.7326/0003-4819-144-10-200605160-00005. PMID: 16702587.
33. Cardozo L, Staskin D, Currie B, et al. Validation of a bladder symptom screening tool in women with incontinence due to overactive bladder. *Int Urogynecol J*. 2014 Dec;25(12):1655-63. doi: 10.1007/s00192-014-2417-7. PMID: 24859795.
34. Diokno AC, Normolle DP, Brown MB, et al. Urodynamic tests for female geriatric urinary incontinence. *Urology*. 1990 Nov;36(5):431-9. PMID: 2238302.
35. Gunthorpe W, Brown W, Redman S. The development and evaluation of an incontinence screening questionnaire for female primary care. *Neurourology and urodynamics*. 2000;19(5):595-607. PMID: 11002302.
36. Haeusler G, Hanzal E, Joura E, et al. Differential diagnosis of detrusor instability and stress-incontinence by patient history: the Gaudenz-Incontinence-Questionnaire revisited. *Acta Obstet Gynecol Scand*. 1995 Sep;74(8):635-7. PMID: 7660771.
37. Khan MS, Chaliha C, Leskova L, et al. The relationship between urinary symptom questionnaires and urodynamic diagnoses: an analysis of two methods of questionnaire administration. *Bjog*. 2004 May;111(5):468-74. doi: 10.1111/j.1471-0528.2004.00126.x. PMID: 15104612.
38. Klingele CJ, Carley ME, Hill RF. Patient characteristics that are associated with urodynamically diagnosed detrusor instability and genuine stress incontinence. *Am J Obstet Gynecol*. 2002 May;186(5):866-8. PMID: 12015497.
39. Klovning A, Hunskaar S, Eriksen BC. Validity of a scored urological history in detecting detrusor instability in female urinary incontinence. *Acta Obstet Gynecol Scand*. 1996 Nov;75(10):941-5. PMID: 9003097.
40. Kujansuu E, Kauppila A. Scored urological history and urethrocystometry in the differential diagnosis of female urinary incontinence. *Annales chirurgiae et gynaecologiae*. 1982;71(4):197-202. PMID: 6889831.
41. Lemack GE, Zimmern PE. Predictability of urodynamic findings based on the Urogenital Distress Inventory-6 questionnaire. *Urology*. 1999 Sep;54(3):461-6. PMID: 10475355.
42. Sand PK, Hill RC, Ostergard DR. Incontinence history as a predictor of detrusor stability. *Obstet Gynecol*. 1988 Feb;71(2):257-60. PMID: 3336562.

43. Suskind AM, Dunn RL, Morgan DM, et al. A screening tool for clinically relevant urinary incontinence. *Neurourol Urodyn*. 2015 Apr;34(4):332-5. doi: 10.1002/nau.22564. PMID: 24464849.
44. Walters MD, Shields LE. The diagnostic value of history, physical examination, and the Q-tip cotton swab test in women with urinary incontinence. *Am J Obstet Gynecol*. 1988 Jul;159(1):145-9. PMID: 3394734.
45. Balk EM, Adam GP, Corsi K, et al. Adverse events associated with nonsurgical treatments for urinary incontinence in women: a systematic review. *J Gen Intern Med*; 2019. p. 1615-25.
46. Ranjbar A, Mehrnoush V, Darsareh F, et al. Vaginal laser therapy for stress urinary incontinence: a systematic review of prospective randomized clinical trials. *J Menopausal Med*. 2022 Dec;28(3):103-11. doi: 10.6118/jmm.22017. PMID: 36647273.
47. Huang Z, Wu S, Yu T, et al. Efficacy of telemedicine for urinary incontinence in women: a systematic review and meta-analysis of randomized controlled trials. *Int Urogynecol J Pelvic Floor Dysfunct*. 2020 08;31(8):1507-13. doi: 10.1007/s00192-020-04340-2. PMID: 32476050.
48. Visser E, de Bock GH, Messelink EJ, et al. Active encouragement of older women with urinary incontinence in primary care to undergo diagnosis and treatment: a matched-pair cluster randomized controlled trial. *Maturitas*. 2015 Feb;80(2):212-9. doi: 10.1016/j.maturitas.2014.11.015. PMID: 25534171.
49. Visser E, Dekker JH, Vermeulen KM, et al. The effect of systematic screening of older women for urinary incontinence on treatment uptake: the URINO trial. *Maturitas*. 2013 Apr;74(4):334-40. doi: 10.1016/j.maturitas.2012.12.015. PMID: 23384977.
50. EvidenceNOW: Managing Urinary Incontinence. Rockville, MD: Agency for Healthcare Research and Quality; Content last reviewed January 2023. <https://www.ahrq.gov/evidencenow/projects/urinary/index.html>. Accessed June 27, 2023.
51. Todhunter-Brown A, Hazelton C, Campbell P, et al. Conservative interventions for treating urinary incontinence in women: an Overview of Cochrane systematic reviews. *Cochrane Database Syst Rev*. 2022 09 02;9:CD012337. doi: 10.1002/14651858.CD012337.pub2. PMID: 36053030.
52. AHRQ Methods for Effective Health Care. In: Chang SM, Matchar DB, Smetana GW, Umscheid CA, eds. *Methods Guide for Medical Test Reviews*. Rockville, MD: Agency for Healthcare Research and Quality 2012.

APPENDIX A. SEARCH STRATEGY

Database: Ovid MEDLINE(R) ALL <1946 to February 07, 2023>

Search Strategy:

-
- 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 | <u>A vs. B</u> 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 | <u>Stress:</u> Sensitivity: 84.1% (95% CI, 81.4–86.4%) Specificity: 86.6% (95% CI, 85–88.1%) <u>Any/Mixed:</u> Sensitivity: 76.3% (95% CI 73.6–78.7%) Specificity: 76.5% (95% CI 74.4–78.4%) | <u>Stress:</u> PPV: 73.3% NPV: 92.5% <u>Any/Mixed:</u> PPV: 67.1% NPV: 83.7% | ROC for diagnosis <u>Stress:</u> 0.865 [95% CI 0.84–0.88] <u>Any/Mixed:</u> 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 Studies⁵²

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).