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No. 397, April 2020 (Replaces No. 127, April 2003, and No. 186, December 2006 and reaffirmed in February 2018)

No. 397 – Conservative Care of Urinary Incontinence in Women



This Clinical Practice Guideline was prepared by the authors and overseen by the Society of Obstetricians and Gynaecologists of Canada (SOGC) Urogynaecology Committee, reviewed by the SOGC Guideline Management and Oversight Committee, and approved by the Board of the SOGC. This Clinical Practice Guideline supersedes the original guidelines, published in April 2003 (No. 127: The Evaluation of Stress Incontinence Prior to Primary Surgery) and December 2006 (No. 186: Conservative Management of Urinary Incontinence; reaffirmed in 2018).

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Key Words: urinary incontinence, conservative care, lifestyle, pelvic floor muscle training

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RECOMMENDED CHANGES IN PRACTICE

1. A careful history and comprehensive physical examination should constitute the foundation of evaluation related to uncomplicated urinary incontinence.
2. Urodynamic studies should be considered only in women with refractory or complicated urinary incontinence symptoms.
3. Cystoscopy should be performed in women presenting with complicated urinary incontinence or gross hematuria. Cystoscopic assessment may be warranted in women with refractory urinary incontinence symptoms.
4. Counselling to support weight loss for all women who are overweight or obese, individualized pelvic floor muscle training, and scheduled voiding regimens should be offered as first-line strategies to all women with urinary incontinence.
5. Pelvic floor muscle training should not be implemented without an appropriate evaluation and adequate patient training. Providing the patient with verbal instructions and written handouts alone does not constitute evidence-based pelvic floor muscle training.

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All people have the right and responsibility to make informed decisions about their care in partnership with their health care providers. In order to facilitate informed choice, patients should be provided with information and support that is evidence-based, culturally appropriate, and tailored to their needs.

This guideline was written using gendered language but is meant to be inclusive of all individuals, including gender diverse individuals who may not identify as women/female. The SOGC is committed to respecting the rights of all people for whom this document may apply, including but not limited to including transgender, gender non-binary, and intersex people. The SOGC encourages health care providers to engage in respectful conversation with patients regarding their gender identity and their preferred gender pronouns, and to apply these guidelines as appropriate to meet each person's needs.

KEY MESSAGES

1. A detailed history combined with appropriate physical examination is sufficient to determine stress urinary incontinence, but not the full spectrum of urinary incontinence.
2. Urine dipstick testing, microscopic urinalysis and urine culture and sensitivity in addition to measurement of post-void residual volume should be included in the routine assessment of urinary incontinence. However, urodynamic studies are not indicated in otherwise healthy women with uncomplicated urinary incontinence.
3. Pelvic floor muscle training represents the most effective first-line therapy for urinary incontinence. The terms "pelvic floor muscle training" and "PFMT" should not be used interchangeably with the term "Kegel exercises." Of note, adjunctive pelvic floor therapies do not appear to provide any benefits over pelvic floor muscle training.
4. Intravaginal mechanical devices (incontinence pessaries) are also an effective first-line therapeutic option for stress urinary incontinence (UI) and mixed UI.

Abstract

Objective: To outline the evidence for conservative care, including both assessment and management options, for urinary incontinence in women.

Intended Users: Relevant primary care providers and medical specialists including but not limited to physicians, nurses, midwives, and pelvic health physiotherapists.

Target Population: Women (>18 years of age) with urinary incontinence.

Options: Assessment options include gathering of a detailed history, physical examination, laboratory analysis, urodynamic evaluation, and cystoscopy. Conservative management options include lifestyle management, pelvic floor muscle training, behavioural management, and mechanical devices.

Outcomes: To provide an evaluation-based summary of current available evidence concerning efficacy of conservative care (assessment and management) strategies for urinary incontinence in women.

Evidence: The Cochrane Library and Medline (2013-2018) were searched to find articles related to conservative care of urinary incontinence in women (>18 years). Articles were appraised, and the collective evidence was graded.

Validation Methods: The evidence obtained was reviewed and evaluated by the Society of Obstetricians and Gynaecologists of Canada (SOGC) Urogynecology Committee under the leadership of the principal authors. The quality of evidence was rated using the criteria described in the Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology framework.

Benefits, Harms, and Costs: Evidence for the efficacy of conservative care (assessment and management) options for women with urinary incontinence is strong. Furthermore, these options carry minimal or no harm and confer an established cost benefit.

Guideline Update: This SOGC Clinical Practice Guideline will be automatically reviewed 5 years after publication.

SUMMARY STATEMENTS

1. Assessment – history (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):
 - History alone is not sufficient to diagnose the full spectrum of urinary incontinence. However, a clear history of urinary leakage with physical activity, in the absence of complicated urinary incontinence features, may be sufficient for stress urinary incontinence diagnosis in conjunction with physical examination.
2. Assessment – physical examination (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):
 - The cough stress test, if positive, is a reliable test to diagnose uncomplicated stress urinary incontinence when complemented by a history consistent with stress urinary incontinence.
 - Measurement of urethral hypermobility alone has poor reliability and remains controversial in the conservative management of urinary incontinence. However, the presence of an immobile, fixed urethra suggests complex urinary incontinence and may warrant further investigation.
3. Assessment – urinalysis (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):
 - Urine dipstick testing, microscopic urinalysis and urine culture and sensitivity along with measurement of post-void residual volume when indicated should be performed in all women with urinary incontinence to rule out infections, hematuria, and proteinuria. Further evaluations are indicated when the post-void residual volume is persistently greater than 150 mL.
4. Assessment – urodynamic studies (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):
 - Urodynamic studies are not indicated in otherwise healthy women with uncomplicated stress urinary incontinence on history and physical examination, as urodynamic study results do not assist with diagnosis or improve treatment outcomes in this group of women. Urodynamic study testing may be warranted in women with complicated urinary incontinence symptoms, urinary incontinence refractory to treatment, or conflicting history and physical examination results.
5. Assessment – cystoscopy (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):
 - Cystoscopic evaluation of the lower urinary tract may be indicated in women with urge urinary incontinence refractory to treatment, continuous urine leakage suspicious for iatrogenic genitourinary injuries or fistulas, persistent post-void dribbling, and hematuria.
6. Management – lifestyle (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):
 - Evidence from one randomized controlled trial and one meta-analysis supports lifestyle modification interventions promoting weight loss as a management strategy to reduce urinary incontinence in women who are overweight or obese. A 5% reduction in weight loss has an impact on the reduction of urinary incontinence symptoms. Caffeine reduction demonstrates reduction in symptoms of urgency and frequency.

7. Management – pelvic floor muscle training (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- Pelvic floor muscle training is an effective therapy for urinary incontinence and can be used alone or as part of a multicomponent therapy that includes lifestyle and behavioural approaches. Progressive programs that are supervised by health care providers are more effective.

8. Management – adjuncts (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- Although current published studies have limitations, currently there does not appear to be any clear added benefit of using adjunctive therapies (biofeedback, electrical stimulation, or vaginal cones).

9. Management – behavioural; bladder training (mixed urinary incontinence, urge urinary incontinence):

- Scheduled voiding regimens represent an important and effective management strategy as a stand-alone therapy or part of a multicomponent therapy that includes lifestyle and pelvic floor muscle training. Women have been more satisfied with voiding regimens compared with no treatment.

10. Management – intravaginal mechanical devices (stress urinary incontinence, mixed urinary incontinence):

- There is evidence that intravaginal mechanical devices (incontinence pessaries) are effective and may be preferred for women who have incontinence in specific situations such as exercise. Intravaginal mechanical devices may not be as effective as pelvic floor muscle training.

RECOMMENDATIONS

1. Assessment – history (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- We recommend eliciting a comprehensive voiding, medical, and surgical history in women with urinary incontinence to distinguish those with uncomplicated stress urinary incontinence from other types of urinary incontinence, in order to better assess the need for further physical examinations and investigations prior to treatment planning (strong, low).

2. Assessment – physical examination (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- We recommend that cough stress test be performed on physical examination to diagnose stress urinary incontinence in conjunction with history taking (strong, low). This cough stress test may have to be done also with reduction of prolapse, if present. While urethral hypermobility may contribute to stress urinary incontinence diagnosis, we recommend against the routine use of Q-tip testing in women with urinary incontinence. The vaginal Q-tip test may be used as an alternative to urethral Q-tip testing in select patients (conditional, moderate).

3. Assessment – urinalysis (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- We recommend that initial investigations include a urinalysis and, if indicated, urine culture and sensitivity and post-void residual

assessment for all women with urinary incontinence. Further evaluations such as a hemoglobin A1c, serum creatinine, and imaging may be considered on a case-by-case basis depending on the results of these initial investigations (strong, moderate).

4. Assessment – urodynamic studies (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- We recommend that in women with uncomplicated urinary incontinence on history and physical examination, routine urodynamic studies not be undertaken prior to treatment planning (strong, high).
- We suggest that urodynamic studies be considered in women with refractory or complicated urinary incontinence symptoms, who have undergone prior incontinence procedures, or with urinary incontinence in the setting of stage 3–4 pelvic organ prolapse (conditional, low).

5. Assessment – cystoscopy (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- We suggest that cystoscopic evaluation be considered in women with hematuria, or refractory and/or complicated urinary incontinence symptoms (conditional, low).

6. Management – lifestyle (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- We recommend counselling to support weight loss as a first-line strategy for all women with urinary incontinence who are overweight or obese (strong, high).
- We recommend counselling related to reducing caffeine to address symptoms of frequency and urgency (conditional, moderate).

7. Management – pelvic floor muscle training (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- We recommend pelvic floor muscle training (individually tailored, inclusive of digital pelvic floor muscle examination) to be offered to all women with urinary incontinence (strong, high).

8. Management – adjuncts (stress urinary incontinence, mixed urinary incontinence, urge urinary incontinence):

- We suggest adjunctive pelvic floor muscle therapies be used on an individualized basis only since there is currently no clear added benefit (conditional, moderate).

9. Management – behavioural; bladder training (mixed urinary incontinence, urge urinary incontinence):

- We recommend scheduled toilet regimens to be offered to all women with urge urinary incontinence and mixed urinary incontinence (strong, high).

10. Management – intravaginal mechanical devices (stress urinary incontinence):

- We recommend mechanical devices be used on an individualized basis. We recommend particular consideration of mechanical devices when women have urinary incontinence with high-impact exercises or when there are barriers in accessing supervised pelvic floor muscle training (strong, high).

INTRODUCTION

Urinary incontinence (UI), the complaint of any involuntary leakage of urine,¹ is a common and significant issue for health services worldwide. Women presenting with UI require careful and comprehensive evaluation in order to determine with certainty the etiology of the incontinence prior to determining the most appropriate management plan. To date, recommendations related to evaluation of UI prior to conservative management differ from evaluation prior to more invasive options such as surgery.^{2,3} As such, the Society of Obstetricians and Gynaecologists of Canada (SOGC) Urogynecology Committee evaluated the literature base related to UI assessment that would precede conservative management.

Conservative management of UI is defined as any therapy that does not involve medication or surgical treatment, including lifestyle interventions, physical therapies, scheduled voiding regimens, complementary and alternative medicines, and mechanical devices such as incontinence

pessaries.¹ A recently published (2016) review of 4 clinical practice guidelines—the European Association of Urology (updated in 2014), the Canadian Urological Association (updated in 2012), the International Consultation on Incontinence (updated in 2012), and the National Collaborating Centre for Women's and Children's Health (updated in 2013)—determined that all of these guidelines recommended a trial of conservative therapy before invasive therapy.³ Research on the effectiveness of conservative management continues to grow; related guidelines were last updated by the SOGC Urogynaecology Committee in 2006.⁴

METHODS

Using the previous SOGC published guideline (2006, reaffirmed in 2018) as a baseline,⁴ an updated literature search of studies on conservative care for urinary incontinence in women was conducted, including studies from January 2013 to April 2018. Additionally, the literature search was expanded to allow for the evaluation of literature related to assessment options. For each conservative care option (assessment or management), the specific research question is provided, followed by the state of the science, level of evidence, and grade of recommendation. In addition, areas identified for further research are presented. [Table 1](#) outlines the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) system, and [Table 2](#) describes the GRADE method for judgement and interpretation of strong and conditional recommendations.⁵

In line with the recommendations of the Cochrane Incontinence Review group and the International Consultation on Incontinence Research Society, we included the individual's subjective report of UI including specific quality of life questionnaires, symptom severity, and objective measurements as outcomes. Further, we acknowledge that the terminology related to conservative care generally lacks uniformity.² The range of terms in use can lead to unintended ambiguity and hinders the ability to rigorously evaluate research to accurately inform clinical practice guidelines. Since the publication of the last SOGC guideline on this topic, members from the International Continence Society and the International Urogynecological Association of collectively developed and published an important document to facilitate standardization in the use of terminology related to conservative care of UI.² We have framed our research questions accordingly to ensure enhanced clarity and rigor of this updated guideline and advocate for attention to the use of this terminology across relevant disciplines to enhance communication and understanding.

DEFINITIONS

Stress urinary incontinence (SUI)	The complaint of involuntary leakage on effort or exertion or on sneezing or coughing
Urge urinary incontinence (UUI)	The complaint of involuntary leakage accompanied by or immediately preceded by urgency
Mixed urinary incontinence (MUI)	The complaint of involuntary leakage associated with urgency and also with exertion, effort, sneezing, and coughing
Pelvic floor muscle training (PFMT)	A structured and individualized program of exercises that aims to improve pelvic floor muscle strength, endurance, power, relaxation, or a combination of these parameters
Cough stress test (CST)	A test that involves visualization of synchronous urinary loss while the patient coughs with a comfortably full bladder (usually at 200–300 mL). CST is used to document the presence of SUI
Q-tip test	Q-tip test is a test for urethral hypermobility where a cotton-tip applicator is inserted into the bladder neck, and vesicourethral angle mobility is observed on coughing. The urethra is considered hypermobile when the straining angle is 30 degrees or greater

Table 1. Key to Grading of Recommendations, Assessment, Development and Evaluation (GRADE)

Strength of the recommendation	Definition
Strong	Highly confident of the balance between desirable and undesirable consequences (i.e., desirable consequences outweigh the undesirable consequences; or undesirable consequences outweigh the desirable consequences).
Conditional (weak) ^a	Less confident of the balance between desirable and undesirable consequences.
Quality level of a body of evidence	Definition
High ++++	We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate +++0	We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low ++00	Our confidence in the effect estimate is limited. The true effect may be substantially different from the estimate of the effect.
Very low +000	We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

^a Conditional (weak) recommendations should not be misinterpreted as weak evidence or uncertainty of the recommendation

SOURCE: GRADE Working Group⁵

Table 2. Judgement and Implications of strong and conditional recommendations

Judgement/implications	Strong recommendation “We recommend...”	Conditional recommendation “We suggest...”
Judgement by guideline panel	It is clear to the panel that the net desirable consequences of a strategy outweighed the consequences of the alternative strategy.	It is less clear to the panel whether the net desirable consequences of a strategy outweighed the alternative strategy.
Implications for patients	Most individuals in this situation would want the recommended course of action, and only a small proportion would not.	Most individuals in this situation would want the suggested course of action, but many would not.
Implications for clinicians	Most individuals should receive the intervention. Adherence to this recommendation according to the guideline could be used as a quality criterion or performance indicator.	Clinicians should recognize that different choices will be appropriate for each individual and that clinicians must help each individual to arrive at a management decision consistent with his or her values and preferences.
Implications for policy makers	The recommendation can be adopted as policy in most situations	Policy making will require substantial debate and involvement of various stakeholders

SOURCE: GRADE Working Group⁵

RECOMMENDATIONS AND DISCUSSION

SUMMARY STATEMENT 1 AND RECOMMENDATION 1

History Taking (Stress Urinary Incontinence, Urge Urinary Incontinence, and Mixed Urinary Incontinence)

In women 18 years or older with urinary incontinence, what features on clinical history are present versus absent to assist with diagnosis of UI?

Careful history taking is essential to distinguish the type of UI that is presented. Thus, a comprehensive history should include questions that distinguish different types of UI (stress, urge, or mixed), symptom severity and urinary frequency, fluid intake, prolapse symptoms such as bulge or

pressure, pad use, and overall impact on the woman's life. Additionally, questions to rule out occult voiding dysfunction, such as presence of urinary hesitancy, spilling of urinary stream, and post-voiding leakage or dribbling, should also be included. Further medication review is important, particularly noting diuretics, narcotics, anticholinergics, antihistamines, psychotropic drugs, alpha- and beta-agonists and blockers, and calcium channel blockers given the established correlation with UI. Finally, information on obstetrical, surgical, and social history, including heavy lifting, smoking, and the presence of chronic constipation, should be gathered to further delineate contributors of UI.⁶

Stress urinary incontinence (SUI) refers to the loss of urinary control with cough, sneeze, or activity, often precipitated by straining and physical exercises. A history suggestive of uncomplicated SUI consists of UI with involuntary micturition loss on physical effort, without a history of recurrent

Table 3. Features suggestive of uncomplicated stress urinary incontinence in women presenting with urinary incontinence symptoms

History	Urinary loss with physical exertion (i.e., cough, laugh, sneeze) No prior extensive pelvic floor repairs No voiding symptoms (e.g., straining, hesitancy, low stream, post-void dribbling, dysuria, position-dependent micturition) Absence of recurrent urinary tract infection Absence of medical conditions including uncontrolled diabetes mellitus, neurologic disorders, or cognitive impairment
Physical examination	Absence of pelvic organ prolapse Positive urinary leakage with cough test on supine or standing position Absence of urethral structural abnormality or rigidity (e.g., “lead-pipe urethra”)
Laboratory tests	Post-void residual consistently ≤ 150 mL Negative result for urinary tract infection, pyuria, or hematuria

urinary tract infection (UTI), voiding dysfunction, or prior pelvic floor repairs (Table 3). However, history alone appears to be a poor predictor for the presence of SUI. A systematic review of 19 studies (3092 patients) found that clinical history alone, when compared with urodynamic findings, shows a sensitivity of 90.6%, specificity of 51.1%, positive predictive value (PPV) of 74.9%, and negative predictive value (NPV) of 77.1% in diagnosing SUI.⁷ A retrospective cohort study of 1179 Brazilian women noted a sensitivity of 27%, specificity of 82%, PPV of 37%, and NPV of 73% when history suggestive of genuine SUI was used to diagnose UI alone.⁸ Harvey et al. showed that isolated symptoms of SUI alone had a PPV of 56%.⁹

In contrast to SUI, patients with urge urinary incontinence (UUI) often provide a history of sudden urgency and inability to reach the toilet, increased daytime and nighttime urinary frequency, and large-volume urinary loss with soaked clothing.³ UUI symptoms, along with the presence of voiding difficulties, continuous leakage, and recurrent UTI, are often found in patients with complicated SUI.⁶ UUI is also more often seen in women who are older, possess concurrent cognitive or neurologic disorders, and have a history of polypharmacy or diabetes mellitus.¹⁰ Given the increase in clinical complexity, history alone is often insufficient to diagnose and treat UUI. A comparison between clinical history suggestive of detrusor overactivity with urodynamic testing showed a sensitivity of 73.5%, specificity of 55.2%, PPV of 56.1%, and NPV of 72.8% in 2950 patients,⁷ while the retrospective examination of 1179 Brazilian women demonstrated a sensitivity of 19%, specificity of 87%, PPV of 40%, and NPV of 70%.⁸

Currently, the accuracy and reliability of history taking alone to accurately diagnose various types of UI have yet to be established. Therefore, patient history alone should not be used as the sole determinant for diagnosing or treating UI.⁷ However, the following, in conjunction with physical examination are sufficient for diagnosis of SUI in

patients without pelvic organ prolapse, without prior extensive pelvic surgery, and without concurrent urge- or voiding dysfunction-related symptoms: a normal post-void residual (PVR) and a clear history of urinary leakage with coughing, straining, or exercise.

SUMMARY STATEMENT 2 AND RECOMMENDATION 2

Physical Examination (SUI, UUI, and MUI)

In women 18 years or older with urinary incontinence, what features on physical examination (cough stress test [CST], Q-tip test) are or are not present to assist with diagnosis of UI?

The purpose of physical examination in women with UI is to further assist with diagnosis and treatment of UI in conjunction with history taking, to determine the extent of urethral mobility and presence of objective or latent SUI, to quantify the presence and stage of any pelvic organ prolapse, to assess genitourinary atrophy if present, and to assess the strength of pelvic floor muscles.³ The CST, consisting of fluid loss visualization from the urethra simultaneous with coughing with a comfortably full bladder, is considered diagnostic of SUI.¹¹ Most women describe a comfortably full bladder at 200–300 mL. Tests in addition to the CST to diagnose UI include the urethral and/or vaginal Q-tip test, 24-hour pad test, and perineal ultrasound to predict UI by assessing perineal length.¹² Appropriate physical examination excludes confounders and contributors to UI symptoms and further assists with management specific to the type of UI a woman is experiencing.

The CST is often considered the most reliable assessment to confirm a diagnosis of SUI.¹³ A small cohort study of 55 women¹⁴ examined the utility of the CST in assessing SUI and found that when urodynamic testing is used as the gold standard, the sensitivity, specificity, PPV, and

NPV of CST were 90%, 80%, 98%, and 44%, respectively, with an 89% concordance ($\kappa = 0.51$). The 24-hour pad test when compared with urodynamic testing had a sensitivity, specificity, PPV, and NPV of 60%, 60%, 94%, and 13%, respectively, with a 67% concordance ($\kappa = 0.26$). As such, the CST was thought to be superior for diagnosing SUI in this group of women, although the study is limited by its small sample size and observational nature. The CST is also highly reproducible in an office setting, as it is associated with less measurement variation than the pad test.^{15,16} Although the CST is ideally conducted with a full bladder in supine position,³ the CST is more sensitive for SUI when the patient is standing, particularly when a positive history of SUI is elicited but supine CST is negative.¹⁷

Objective SUI is thought to result from a loss of pressure transmission of the abdominal pressure to the urethrovesical junction secondary to urethral prolapse.¹⁸ As such, urethral hypermobility (the movement of urethral angle $\geq 30^\circ$ from the supine horizontal plane on Q-tip test) is present in most women with SUI symptoms. Although the Q-tip test is an objective marker for urethral hypermobility and is often predictive of SUI findings on urodynamic testing,¹⁹ significant patient discomfort and theoretical UTI risks may be associated with the test, and agreement may be poor regarding a positive or negative Q-tip test result when the straining angle ranges between 21 and 49 degrees.²⁰ In addition, there appears to be a strong correlation in the extent of anterior compartment pelvic organ prolapse and degree of urethral hypermobility on Q-tip testing based on several large retrospective cohort and database studies.^{21–23} At present, there appears to be no accepted gold standard for urethral hypermobility testing. Overall, the role of urethral hypermobility testing remains limited in non-surgical SUI management.

While the value of determining urethral hypermobility remains controversial in the conservative management of UI, decreased urethral mobility in women with prior bladder neck surgeries may predict limited value of subsequent Mid-urethral sling surgeries. There is some evidence that surgical outcomes may be better in women with bladder neck hypermobility,²⁴ and reserving such assessment for more invasive treatment may be warranted. When urethral hypermobility testing remains necessary in select patients, a randomized controlled trial (RCT) consisting of 140 patients comparing the vaginal Q-tip test to urethral Q-tip test shows clinical equivalence between the 2 tests, with a higher patient preference and lower discomfort level in patients receiving the vaginal Q-tip test.²⁴

SUMMARY STATEMENT 3 AND RECOMMENDATION 3

Laboratory Testing (SUI, UII, and MUI)

In women 18 years or older with UI, what laboratory tests (urinalysis, culture) are required versus not required to assist with diagnosis?

In women with UI, the presence of recurrent UTIs suggests the presence of complicated UI.⁶ UTIs should therefore be excluded in all women with UI by a clean mid-stream urine or catheterization. The mid-stream urine specimen should then be tested by both urinalysis and microscopy because the presence of hematuria, glycosuria, and proteinuria may warrant further workup.¹⁰ Urine dipstick testing and culture are especially important in women presenting with UII. In a multicentre RCT of 183 U.S. women with moderate to severe UII by symptomatology, 51.1% had RNA sequence-positive urine for the 8 most prevalent bacterial urotypes.²⁵ The presence of urine bacterial DNA is associated with higher daily UII episodes.²⁶ As such, urine dipstick testing, microscopic urinalysis, and urine culture and sensitivity should be the first-line investigations in women presenting with UI.

Women with UI who exhibit a PVR urine greater than 150 mL, by either catheterization or sonography, should be evaluated for pelvic organ prolapse, overflow incontinence secondary to chronic urinary retention, or other causes of bladder outlet obstruction. A persistently elevated PVR in the absence of prolapse warrants further investigations of the bladder emptying mechanism, including a comprehensive neurologic assessment, renal/pelvic ultrasound, and urodynamic testing.⁶

Ultrasound evaluation should be considered in women with advanced pelvic organ prolapse to rule out hydronephrosis, since it was found that 17% of women with prolapse had some degree of hydronephrosis on renal ultrasound, with older age and more advanced prolapse being predictors of worsening hydronephrosis.²⁷ This is particularly relevant for women with elevated PVRs, recurrent UTIs, or reduced kidney function on initial investigation. Serum creatinine may be elevated in patients with chronic bladder outlet obstruction, renal parenchymal loss, or detrusor muscle denervation.¹⁰ Creatinine levels are poorly correlated with the presence of hydronephrosis on imaging.²⁷

Other useful laboratory tests include a serum creatinine, which may be elevated in patients with bladder outlet

obstruction or detrusor muscle denervation,¹⁰ and a HbA_{1c} in patients at risk for impaired glucose tolerance or diabetes mellitus.

SUMMARY STATEMENT 4 AND RECOMMENDATION 4

Urodynamic Testing (SUI, UUI, and MUI)

In women 18 years or older with UI, would urodynamic testing, compared with doing nothing, assist with diagnosis or improvement of outcomes?

Multichannel urodynamic testing assesses urinary function by measuring various aspects of urinary storage and emptying, including cystometry, uroflometry, urethral pressure profile testing, and leak point pressure testing. Urodynamic studies (UDS) may lead to a more accurate diagnosis of incontinence type, compared with history and physical examination alone, in women with complicated UI. A retrospective series of 39 women with UI who underwent multichannel UDS assessment found that urodynamic testing results altered management in 26.9% of participants who opted for medical management.²⁶ Data from several retrospective cohort studies showed that UDS testing appeared to better delineate overactive bladder symptoms in women with mixed urinary incontinence (MUI) and may be a useful adjunct for operative planning in settings of MUI^{28,29} or anti-incontinence sling removal.³⁰ In another retrospective single-cohort study of 307 Chinese women, UDS ruled out disadvantageous factors such as bladder outlet obstruction and overactive bladder in 22.4% of women scheduled to undergo surgery for pelvic organ prolapse or UI.³¹ Current indications for urodynamic testing include the presence of complicated SUI or MUI, when objective findings do not correlate with subjective symptoms, treatment failure, or surgical planning in select instances.³²

However, UDS testing possesses several pitfalls, including the lack of technical standardization, production of non-physiologic results due to the artificial set-up, and the disparity between clinically relevant and urodynamically positive results.³³ UDS testing, therefore, should be used only as an adjunct to thorough history taking, physical examination, and laboratory testing in the diagnosis and management of UI.

Several large RCTs to date have reported that for women with uncomplicated SUI, as indicated by observed urinary leakage on provocative maneuvers, a negative urine culture

and normal PVR, and absence of prolapse or pelvic floor surgeries, preoperative office assessment alone was not inferior to urodynamic evaluation for SUI surgery outcomes. A large RCT of 630 women with predominant uncomplicated SUI symptoms undergoing office SUI evaluation only, compared with multichannel UDS testing, had similar SUI treatment success rates, patient satisfaction, or adverse events one year post surgery.³⁴ Another meta-analysis of 4 RCTs (775 patients) also found no difference in subjective cure rate between women undergoing careful office evaluation versus UDS testing (Relative Risk 1.02; 95% confidence interval [CI] 0.90–1.15; $P = 0.79$).³⁵ A multicentre Dutch cohort study with a nested RCT, which randomly assigned women with discordant findings between office evaluation for SUI and UDS testing to either immediate surgery or conservative management, showed no difference in SUI cure rate, complications, or patient satisfaction between the surgery and conservative management groups (difference in mean improvement 5 points favouring immediate surgery; 95% CI ∞ to 5).³⁶ So, UDS testing does not appear to improve treatment outcomes in women with uncomplicated SUI, but it may be beneficial in women with complicated SUI, UI refractory to treatment, or equivocal symptomology and physical examination findings.

SUMMARY STATEMENT 5 AND RECOMMENDATION 5

Cystoscopic Evaluation (SUI, UUI, and MUI)

In women 18 years or older with UI, would cystoscopic evaluation, compared with doing nothing, assist with diagnosis or improvement of outcomes?

Cystourethroscopy involves the examination of bladder, ureteric orifices, and urethra under cystoscopic evaluation with the patient awake or under anaesthesia, is commonly performed by urogynaecologists or urologists, and is a procedure considered when a graduate from a recognized Canadian obstetrics and gynecology fellowship program is deemed competent to perform this procedure.³⁷ Currently, cystoscopy is most commonly used to rule out intraoperative genitourinary tract injuries, and its role remains limited in the diagnosis of uncomplicated UI in otherwise healthy women.³⁸ However, cystoscopy is indicated in women with refractory UUI in the absence of a UTI, in women with continuous urinary leakage suspicious for a genitourinary fistula or iatrogenic genitourinary injuries, post-void dribbling suggestive of the presence of a urethral diverticulum,

rapidly worsening UI symptoms, hematuria, or risk factors for bladder malignancy.³⁸

SUMMARY STATEMENT 6 AND RECOMMENDATION 6

Lifestyle Management (SUI, UII, and MUI)

In women with urinary incontinence does lifestyle management, when compared with other conservative interventions or doing nothing, decrease incontinence?

Lifestyle management applications are important when the health concern in question relates to lifestyle parameters including a healthy diet, fluid intake, and weight management.² Evaluating the pooled studies, we were able to apply recommendations for only one aspect of lifestyle management: weight loss. Abdominal obesity appears to be associated with UI.³⁹ Increased intra-abdominal pressure present in women with obesity has been proposed as a mechanism that may compromise optimal pelvic floor function, thereby contributing to the development of UI.⁴⁰ Further, it has been suggested that sustained increased intra-abdominal pressure could also contribute to UI by causing detrusor instability.⁴¹ A recent rigorously conducted systematic review⁴² concluded that weight loss would be considered standard practice for women who are overweight or obese and who have UI. Moreover, Auward et al. (2008) determined that, in women who are overweight or obese, a weight loss of over 5 kg from initial weight reduces severity of UI and improves quality of life.⁴³ A recent longitudinal study corroborated these results, concluding that weight loss in incontinent women with obesity reduces the prevalence of UI, especially among women with stress UI.⁴⁴

One randomized trial⁴⁵ and one epidemiologic study⁴⁶ have confirmed that decreasing caffeine intake improves continence as well as related symptoms of urgency and frequency. Although these studies primarily evaluated men, evidence suggests that decreasing caffeine reduces symptoms of frequency and urgency. Furthermore, some studies have investigated the role of dietary modification, including an elimination diet,⁴⁷ and constipation management,⁴ but we were unable to grade these interventions based on the limitations of the current literature base. Future research in these areas, inclusive of clinical research based on emerging microbiome science, is needed.

SUMMARY STATEMENT 7 AND RECOMMENDATION 7

Pelvic Floor Muscle Training (SUI, UUI, and MUI)

In women with urinary incontinence, does pelvic floor muscle training (PFMT), when compared with other conservative interventions or doing nothing, decrease incontinence?

The largest literature base regarding conservative management for UI relates to PFMT. PFMT aims to improve pelvic floor muscle strength, endurance, power, relaxation, or a combination of these parameters.² Distinct mechanisms of action of PFMT have been proposed for both SUI and UUI. For SUI, 3 mechanisms have been described⁴⁸ and include the use of conscious pelvic floor muscle pre-contraction during or preceding increases in intra-abdominal pressure (the “Knack”); pelvic floor muscle strength and associated stiffness; and coordination of muscle contraction between the pelvic floor muscles and associated deep abdominal muscles. For UUI, the biologic rationale for the use of PFMT is less clear, but a reflex inhibition of detrusor contraction has been demonstrated with an electrically stimulated contraction of the pelvic floor muscles.⁴⁹ Further, it has also been suggested that reflex inhibition of detrusor contraction may accompany repeated voluntary pelvic floor muscle contractions.⁵⁰ The most current update of the Cochrane Collaboration’s review of this topic⁵¹ supports the previous review’s conclusion,⁵² recommending PFMT as the first-line conservative management strategy for women with SUI, MUI, UUI, and UI of any type. There were 9 new trials included in this 2017 update, representing a wider range of populations, countries, and secondary outcomes, inclusive of patient-centred outcomes. These new trials actually emphasized the strength of PFMT for women with UI. In almost all of the new included trials, PFMT training protocols were progressive and individualized, including examination of the pelvic floor muscles. More intensive programs that were supervised were more effective.

Specifically, the National Institute for Health and Care Excellence (NICE) recommends a trial of supervised PFMT for a minimum of 3 months as a first-line treatment. If benefit is derived, NICE recommends continuing an exercise program for these patients.⁵³ In addition to achieving cure or a reduction of number of leaking episodes, multiple trials also demonstrate improvement in quality of life and other pelvic health issues.⁵¹ For example, Delneri et al. (2016) found a positive effect on sexual

function among women with SUI and MUI.⁵⁴ The literature clearly demonstrates health professional–taught, individualized, and supervised PFMT to be superior to self-directed, generic PFMT.⁵¹ Typically, PFMT is implemented by pelvic health physiotherapists; however, the evidence in favour of this intervention highlights the need for all relevant health care providers (physicians, nurses, midwives, and physiotherapists) to better employ this care given the limitations related to accessing specialized pelvic health physiotherapists. Thus, there is a need for improved training of primary care providers to improve the knowledge translation of PFMT so this intervention is routinely enacted by all relevant health care providers. Further research related to longer-term efficacy, indirect modes of PFMT, and cost-effectiveness is needed.

SUMMARY STATEMENT 8 AND RECOMMENDATION 8

Adjunctive Therapies (SUI, UUI, and MUI)

In women with UI, do adjunctive pelvic floor muscle therapies, when compared with other conservative interventions or doing nothing, decrease incontinence?

Adjunctive therapies refer to any treatment or modality used to augment or assist the primary treatment. Where conservative management for UI is concerned, adjunctive therapies typically refer to equipment or a secondary therapy used to supplement the effect of PFMT (e.g., the use of biofeedback or neuromuscular electrical stimulation to augment PFMT).²

Related to vaginal cones specifically, 14 trials indicated a similar effect to PFMT, and 2 trials indicated no additional clinical or patient-perceived benefit of using vaginal cones.⁵⁵ Health care professionals should consider patient resources and preferences specifically to weigh in clinical decision making to include other modalities. Some adverse events were reported across studies, indicating discomfort with this modality. Similarly, although found to be superior to no treatment,⁵³ no added benefit was conferred using electrical muscle stimulation (EMS) in addition to PFMT.⁵³ Furthermore, EMS is a modality that has also been reported to be uncomfortable for some women.^{55,56} Likewise, a recent trial conducted by Bertotto et al. (2017) indicated no added benefit of biofeedback over PFMT.⁵⁷ These authors examined a diverse array of outcome measures inclusive of quality of life measures.⁵⁷ Currently a systematic review is being

conducted by the Cochrane Collaboration on this topic to better understand the potential benefit of these adjunctive therapies.

SUMMARY STATEMENT 9 AND RECOMMENDATION 9

Behavioural Management (UUI and MUI)

In women with UUI or MUI, does behavioural management (scheduled voiding regimens), when compared with other conservative interventions or doing nothing, decrease incontinence?

Behaviour therapy refers to a type of psychotherapy that attempts to modify observable maladjusted patterns of behaviour by substituting a new response or set of responses to a given stimulus.² Scheduled voiding regimens refer to voiding on a predetermined schedule, which includes a progressive voiding schedule using relaxation and distraction techniques for urgency suppression. Scheduled voiding regimens have been categorized as bladder training, timed voiding, habit training, and prompted voiding.² Bladder training is a term often used interchangeably with bladder drills and refers to a program of patient education, along with a scheduled voiding regimen with gradually adjusted voiding intervals.² Timed voiding refers to a passive toileting assistance program characterized by a fixed voiding schedule. It is initiated and maintained by caregivers for patients who cannot participate in independent toileting.² Prompted voiding is used to teach people to initiate their own toileting through requests for help and positive reinforcement from caregivers, often done in combination with a scheduled voiding regimen, typically every 2 hours.² Both the Canadian Urological Association and the European Association of Urology gave a level 2, grade A evidence recommendation for bladder training (which in this case included caffeine restriction) as a first-line management approach for UUI or MUI.⁴ We found no literature that would augment this recommendation.

Compared with no treatment, women are more satisfied with behavioural management than with no treatment, and there are no adverse effects.⁵¹ Further research is needed to better understand methods that may yield longer-term results related to scheduled voiding regimens. Scheduled toilet regimens may be preferred by women and clinicians since they are not associated with any negative side effects.

SUMMARY STATEMENT 10 AND RECOMMENDATION 10

Intravaginal Mechanical Devices (SUI and MUI)

In women with SUI or MUI, do intravaginal mechanical devices, when compared with other conservative interventions or doing nothing, decrease incontinence?

Intravaginal mechanical devices are devices intended to provide some support to the bladder neck and possibly some compression to the urethra to correct SUI.² These would include the continence pessary, the Uresta device (a reusable silicone-based bladder support; www.uresta.com) and the Impressa device (a disposable silicone-based bladder support; www.poise.com/en-ca/products/impressa/introduction). There is some evidence that mechanical devices are effective and may be preferable for women who have incontinence in specific situations such as exercise.⁵⁸ Authors of a very recent prospective cohort study investigating both a disposable bladder support as well as a continence pessary concluded that mechanical devices significantly decrease urinary leakage and bother during exercise.⁵⁹ Additionally, these authors determined confidence and satisfaction are increased among women who used a mechanical device.⁵⁹ Furthermore, 2 sequentially conducted RCTs^{60,61} investigated the effect of a therapeutic-grade intravaginal mechanical device compared with a sham device. In both studies researchers found the intravaginal mechanical device to significantly reduce the short-term objective measures of urine loss due to SUI.^{60,61} Finally, a randomized trial comparing the use of a continence pessary with a “behavioural intervention” that comprised physiotherapist-directed PFMT demonstrated the behavioural intervention to be superior to the continence pessary group, and there was no added benefit in combining the 2 interventions.⁶² Further research is needed to confirm these findings and also evaluate long-term outcomes including patient satisfaction. However, a benefit of using intravaginal mechanical devices is immediate symptom resolution.

CONCLUSION

UI is common in women, and although a relatively low proportion of women seek care, there are several effective conservative care options, which we recommend as first-line care strategies. Health care providers should routinely practice in accordance with the recommendations here prior to moving to pharmacologic or surgical care strategies for UI. We acknowledge that although many trials investigating conservative management exist, the standards

of these trials vary significantly. As such, future trials should aim to be powered appropriately to attend to intervention consistency.

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