

THE EVALUATION OF STRESS INCONTINENCE PRIOR TO PRIMARY SURGERY

These guidelines have been prepared by the Urogynaecology Committee and were approved by the Executive and Council of the Society of Obstetricians and Gynaecologists of Canada.

PRINCIPAL AUTHOR

Scott A. Farrell, MD, FRCSC, Halifax NS

UROGYNACOLOGY COMMITTEE

Scott A. Farrell, MD, FRCSC (Chair), Halifax NS
Annette Epp, MD, FRCSC, Saskatoon SK
Cathy Flood, MD, FRCSC, Edmonton AB
François Lajoie, MD, FRCSC, Sherbrooke QC
Barry MacMillan, MD, FRCSC, London ON
Thomas Mainprize, MD, FRCSC, Calgary AB
Magali Robert, MD, FRCSC, Calgary AB

Abstract

Objective: To provide clinical guidelines for the evaluation of women with stress urinary incontinence prior to primary anti-incontinence surgery.

Options: The modalities of evaluation range from basic pelvic examination through to the use of adjuncts including ultrasound and urodynamic testing.

Outcomes: These guidelines provide a comprehensive approach to the preoperative evaluation of urinary incontinence to ensure that excessive evaluation is avoided without sacrificing diagnostic accuracy.

Evidence: Published opinions of experts, supplemented by evidence from clinical trials, where appropriate.

Values: The quality of the evidence is rated using the criteria described by the Canadian Task Force on the Periodic Health Examination.

Benefits, harms, and costs: Comprehensive evaluation of women considering surgery to treat urinary incontinence is essential to rule out causes of incontinence that may not be amenable to surgical treatment. Simplifying the evaluation minimizes the discomfort and embarrassment potentially experienced by women.

Recommendations:

1. Thorough evaluation of each woman is essential to determine the underlying etiology of the urinary incontinence and to guide management. (II-3B)

2. Preoperative pelvic examination should be performed to identify pelvic masses that may provoke lower urinary tract symptoms (e.g., a large fibroid uterus impinging on the bladder), concomitant pelvic organ prolapse, and to rule out latent stress incontinence. All of these findings may necessitate a modification of the surgical approach. (III-C)
3. Hypermobility of the urethra should be confirmed preoperatively, as women with fixed, well-supported bladder necks are less likely to experience a cure following standard anti-incontinence procedures. (II-2B)
4. Stress incontinence should be objectively demonstrated prior to anti-incontinence surgery. (III-B)
5. The volume of postvoid residual urine should be measured prior to anti-incontinence surgery. Elevated postvoid residual volumes are uncommon and should signal the need for further evaluation of the voiding mechanism. (III-C)
6. Urinary tract infection should be identified and treated prior to initiating further investigation or therapeutic intervention for urinary incontinence. (II-2B)
7. In women presenting with pure stress incontinence that can be objectively demonstrated during examination, preoperative urodynamic testing is not necessary (II-3B). For women with other lower urinary tract symptoms and/or mixed urinary incontinence, the clinician's judgment must guide the use of preoperative urodynamic testing (II-3B).

Validation: These guidelines have been approved by the Urogynaecology Committee and the Executive and Council of the Society of Obstetricians and Gynaecologists of Canada.

Key Words

Stress incontinence, evaluation, surgery

J Obstet Gynaecol Can 2003;25(4):313-8.

These guidelines reflect emerging clinical and scientific advances as of the date issued and are subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Local institutions can dictate amendments to these opinions. They should be well documented if modified at the local level. None of the contents may be reproduced in any form without prior written permission of SOGC.

INTRODUCTION

These guidelines have been developed for the preoperative evaluation of uncomplicated stress urinary incontinence, and therefore apply *only* to women presenting with either pure stress incontinence or mixed incontinence who have not previously undergone anti-incontinence or pelvic organ prolapse surgery.

For purposes of clarity in the following discussion, the following terms are defined.

Stress urinary incontinence is the complaint of involuntary leakage on effort or exertion, or on sneezing or coughing.¹

Pure stress urinary incontinence is used to describe the symptom of isolated stress incontinence, without urge incontinence or other symptoms of bladder or voiding dysfunction.¹

Urge urinary incontinence is the complaint of involuntary leakage accompanied by or immediately preceded by urgency.¹

Pure urge urinary incontinence is used to describe the symptom of isolated urge incontinence without stress incontinence or other symptoms of bladder or voiding dysfunction.¹

Mixed urinary incontinence is the complaint of involuntary leakage associated with urgency and also with exertion, effort, sneezing, and coughing.¹

Latent stress urinary incontinence is stress incontinence that occurs (or is unmasked) only when pelvic organ prolapse is reduced (during physical examination or after pessary insertion).²

It should be carefully noted that all the definitions above describe symptoms alone.

The quality of the evidence of the recommendations within this guideline have been ranked using the criteria described

by the Canadian Task Force on the Periodic Health Examination (Table 1).³

BASIC ELEMENTS OF EVALUATION

Women presenting with urinary incontinence require careful and comprehensive evaluation in order to determine with certainty the etiology of the incontinence prior to undergoing anti-incontinence surgery. The following components comprise the minimal acceptable preoperative evaluation:

1. Focused history
2. Pelvic examination
3. Demonstration of mobility of the urethrovesical junction (i.e., the bladder neck)
4. Objective evidence of stress incontinence (including assessment for latent stress incontinence)
5. Postvoid residual urine volume measurement
6. Urinalysis and urine culture

For each element of the evaluation, the purpose, methodological options, and application of the information will be discussed.

FOCUSED HISTORY

Though research has shown that historical information alone is not sufficient to establish a diagnosis⁴ for urinary incontinence, a careful, focused history of the urinary incontinence symptoms may help to formulate the differential diagnosis and direct the

TABLE 1 QUALITY OF EVIDENCE ASSESSMENT ³	CLASSIFICATION OF RECOMMENDATIONS ³
<p>The quality of evidence reported in these guidelines has been described using the Evaluation of Evidence criteria outlined in the Report of the Canadian Task Force on the Periodic Health Exam.</p> <p>I: Evidence obtained from at least one properly randomized controlled trial.</p> <p>II-1: Evidence from well-designed controlled trials without randomization.</p> <p>II-2: Evidence from well-designed cohort (prospective or retrospective) or case-control studies, preferably from more than one centre or research group.</p> <p>II-3: Evidence obtained from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of treatment with penicillin in the 1940s) could also be included in this category.</p> <p>III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.</p>	<p>Recommendations included in these guidelines have been adapted from the ranking method described in the Classification of Recommendations found in the Canadian Task Force on the Periodic Health Exam.</p> <p>A. There is good evidence to support the recommendation that the condition be specifically considered in a periodic health examination.</p> <p>B. There is fair evidence to support the recommendation that the condition be specifically considered in a periodic health examination.</p> <p>C. There is poor evidence regarding the inclusion or exclusion of the condition in a periodic health examination, but recommendations may be made on other grounds.</p> <p>D. There is fair evidence to support the recommendation that the condition not be considered in a periodic health examination.</p> <p>E. There is good evidence to support the recommendation that the condition be excluded from consideration in a periodic health examination.</p>

subsequent evaluation. The distinguishing historical features of the different causes of urinary incontinence are found in Table 2.

RECOMMENDATION

1. Thorough evaluation of each woman is essential to determine the underlying etiology of the urinary incontinence and to guide management. (II-3B)

PELVIC EXAMINATION

Pelvic examination is undertaken to achieve the following goals:

1. To identify pelvic masses impinging upon the urinary tract structures,
2. To quantify the degree of pelvic organ prolapse in each of the anterior, middle, and posterior vaginal compartments,
3. To detect latent stress incontinence,
4. To assess the strength and voluntary control of the levator ani muscles,
5. To determine the health of the urogenital mucosa (i.e., to rule out the presence of urogenital atrophy and/or vulvovaginal irritation or infection).

Physical examination of a woman with incontinence should ideally be performed with the woman having a full bladder and in the supine position (lithotomy or left lateral). The perineum should be inspected for any evidence of chronic skin irritation. The integrity of the sacral nerve roots can be assessed by a simple neurologic evaluation, including the anocutaneous and bulbocavernosus reflexes, sensation to the touch, and voluntary contraction of the external anal sphincter.

The appearance of the vaginal epithelium can be judged on speculum examination and used clinically as an indirect measure of estrogen exposure. The speculum examination should also include an assessment of the degree of pelvic organ prolapse in each compartment of the vagina, with the patient performing Valsalva manoeuvres during examination, as follows:

- (a) *Vault or uterine prolapse*: slow withdrawal of the open Graves' speculum.
- (b) *Cystocele*: retraction on the posterior vaginal wall with either the bottom half of the Graves' speculum or a Sims' speculum. The contribution of paravaginal and central components to the cystocele can be determined by supporting the anterior vaginal fornices using ring forceps. Urethral mobility can be assessed at this time.
- (c) *Rectocele*: with the speculum retracting the anterior vaginal wall, the rectocele with/without enterocele can be graded.

Following speculum examination, the woman is asked to cough or perform a Valsalva manoeuvre in the supine position. If stress loss is not evident in this position, the manoeuvre is repeated in the standing position. In women with moderate to severe degrees of prolapse, latent incontinence may be unmasked during coughing or straining while the prolapse is reduced either manually or with a speculum or non-obstructing pessary.

Bimanual pelvic examination permits detection of pelvic masses impinging on the urinary tract, allows for further assessment of the components of pelvic relaxation, and provides an opportunity to assess the woman's ability to isolate and contract the levator ani muscles (which are palpable along the vaginal sidewall just proximal to the hymenal ring).

Finally, the woman should be instructed to void, and the postvoid residual urine volume measured. This measurement can be performed using straight catheterization or bedside ultrasound.

RECOMMENDATION

2. Preoperative pelvic examination should be performed to identify pelvic masses that may provoke lower urinary tract symptoms (e.g., a large fibroid uterus impinging on the bladder), concomitant pelvic organ prolapse, and to rule out latent stress incontinence. All of these findings may necessitate a modification of the surgical approach. (III-C)

Question	GSI	UI	Overflow
Description of incontinence episodes	Loss with cough, sneeze, or activity	Sudden urgency with inability to reach toilet	Continuous slow loss
Precipitating factors	Cough, physical exercise, strain	Full bladder, sensory triggers (e.g., running water)	None, stress may exacerbate
Urinary frequency	Normal	Often increased	Urinary hesitancy, inability to void
Nocturia	<1	Variable	Nocturnal enuresis
Volume of urine loss	Small amounts, pad sufficient	Large amounts, soaked clothing, runs down leg	Continuous dribbling

GSI = genuine stress incontinence; UI = urgency incontinence

TABLE 3

THE Q-TIP TEST

- A lubricated Q-tip cotton swab is inserted into the external urethral meatus and is advanced until resistance decreases, indicating that the bladder has been entered. It is then withdrawn until resistance is first perceived. It should now be located at the urethrovesical junction (i.e., bladder neck).
- Using a simple goniometer, which measures the angle formed between the distal portion of the Q-tip and the horizontal, the angle is measured at rest and the test repeated with the patient performing a maximal Valsalva manoeuvre.
- The excursion of the Q-tip during straining is an indirect measure of urethral mobility. A Q-tip angle at rest or with straining of $>30^\circ$ is considered abnormal.

DEMONSTRATION OF MOBILITY OF THE URETHROVESICAL JUNCTION

The reported pathophysiology of genuine stress incontinence includes a loss of pressure transmission to the urethrovesical junction (bladder neck).⁵ This loss of pressure transmission is a consequence of prolapse of the urethra when intra-abdominal pressure increases.⁵ A critical part of the preoperative evaluation is therefore the demonstration of hypermobility of the urethra. This can be accomplished objectively by using a Q-tip test⁶ (Table 3), or by using ultrasound,^{7,8} or subjectively by observing the position of the bladder neck at rest and during straining, or by using urethroscopy. These subjective methods have not been examined for their reliability.

Patients with fixed, elevated urethras are less likely to experience a cure of their stress incontinence with surgery.^{9,10}

RECOMMENDATION

- 3. Hypermobility of the urethra should be confirmed preoperatively, as women with fixed, well-supported bladder necks are less likely to experience a cure following standard anti-incontinence procedures. (II-2B)**

OBJECTIVE EVIDENCE OF STRESS INCONTINENCE (INCLUDING ASSESSMENT FOR LATENT STRESS INCONTINENCE)

Objective evidence of stress incontinence should be sought prior to surgical intervention. Latent stress incontinence must be detected preoperatively to ensure that the surgical plan includes necessary anti-incontinence surgery. Observation of urine loss associated with a cough or Valsalva manoeuvres during a supine pelvic exam is acceptable evidence of stress incontinence.² The stress test is a more standardized means of demonstrating stress

incontinence. In this test, the bladder is filled with 200 mL to 300 mL of fluid, and the woman coughs in a standing position. The test is considered positive if stress loss is seen, and negative if no urine leak is identified. To detect latent stress incontinence, the stress test is performed with the prolapse reduced. In the absence of objective evidence of stress incontinence, the pad test may be used (Table 4).¹¹

RECOMMENDATION

- 4. Stress incontinence should be objectively demonstrated prior to anti-incontinence surgery. (III-B)**

POSTVOID RESIDUAL URINE VOLUME MEASUREMENT

Measurement of postvoid residual urine volume can be accomplished by using straight catheterization or by ultrasound.¹² Ultrasound is less invasive and accurate enough for routine clinical use.^{13,14} A residual volume of <100 mL is generally accepted as normal.¹²

RECOMMENDATION

- 5. The volume of postvoid residual urine should be measured prior to anti-incontinence surgery. Elevated postvoid residual volumes are uncommon and should signal the need for further evaluation of the voiding mechanism. (III-C)**

URINALYSIS AND URINE CULTURE

Urinary tract infection can mimic various causes of urinary incontinence, including detrusor overactivity (instability) and urodynamic (genuine) stress incontinence.¹⁵ A midstream urine specimen should be tested both by urinalysis and microscopy. Urine obtained by catheterization provides a cleaner specimen for culture, though on urinalysis, catheter specimens may be falsely positive for blood. In symptomatic patients, urinalysis has a significant false negative rate and should be accompanied by urine culture and sensitivity.¹⁶

RECOMMENDATION

- 6. Urinary tract infection should be identified and treated prior to initiating further investigation or therapeutic intervention for urinary incontinence. (II-2B)**

URODYNAMICS

While urodynamic testing, including cystometry and urethral pressure profilometry, can detect detrusor overactivity (instability) and compromised urethral function, the clinical significance of these findings is controversial.¹⁷ The detection of an unstable bladder and/or low-pressure urethra may modify patient management options and surgical outcomes. However, patients with mixed incontinence symptoms and proven unstable bladder still have high rates of cure following incontinence surgery.^{18,19} The

TABLE 4

THE STANDARDIZED PAD TEST

Typical test schedule:

1. Test is started without the patient voiding.
2. Prewedged collecting device is put on and the first one-hour test period begins.
3. The woman drinks 500 mL sodium-free liquid within a short period (maximum of 15 minutes), then sits or rests.
4. Half-hour period: the woman walks, including stair climbing equivalent to one flight up and down.
5. During the remaining period, the woman performs the following activities:
 - a) standing up from sitting, ten times;
 - b) coughing vigorously, ten times;
 - c) running on the spot for one minute;
 - d) bending to pick up small object from floor, five times; and
 - e) washing hands in running water for one minute.
6. At the end of the one-hour test, the collecting device is removed and weighed.
7. If the test is regarded as representative, the woman voids and the volume is recorded.
8. Otherwise, the test is repeated, preferably without voiding. If the collecting device becomes saturated or filled during the test, it should be removed and weighed, and replaced by a fresh device. The total weight of urine lost during the test period is taken to be equal to the gain in weight of the collecting device(s). In interpreting the results of the test, it should be borne in mind that a weight gain of up to 1 g may be due to weighing errors, sweating, or vaginal discharge.

The activity may be modified according to the woman's physical ability. If substantial variations from the usual test schedule occur, they should be recorded so that the same schedule can be used on subsequent occasions.

diagnosis of a low urethral pressure is controversial and a recent prospective study has demonstrated that in women with a maximum urethral closure pressure of less than 20 cm of water, the Burch procedure and the pubovaginal sling procedure produce equivalent short-term subjective and objective results.²⁰ The cost effectiveness of urodynamic testing before surgery has been questioned,²¹ and because of the widespread lack of availability of urodynamic equipment, the Agency for Health Care Policy and Research in the United States has developed clinical practice guidelines for identifying patients who could undergo surgery without undergoing preoperative urodynamic testing.²²

A recent Cochrane review concluded that there is a lack of research evidence proving that urodynamic testing improves patient outcomes following surgery.¹⁷ The reproducibility and reliability of urodynamic testing is also questionable.²³⁻²⁵ Until the usefulness of urodynamic testing is proven, its use in the evaluation of women with *primary symptoms* of stress urinary incontinence must be left to the discretion of the treating physician. Until further research is conducted, the issue of preoperative urodynamics testing will remain controversial.

RECOMMENDATION

7. In women presenting with pure stress incontinence that can be objectively demonstrated during examination, preoperative urodynamic testing is not necessary (II-3B). For women with other lower urinary tract symptoms and/or mixed urinary incontinence, the clinician's judgment must guide the use of urodynamic testing (II-3B).

DISCUSSION

These guidelines provide a structure for the basic evaluation of women prior to anti-incontinence surgery for uncomplicated stress urinary incontinence. They are by no means exhaustive and are intended only for a select group of women who present with either pure stress incontinence or mixed incontinence and who have not previously undergone anti-incontinence or pelvic organ prolapse surgery. More extensive evaluation may be necessary in selected individual cases.

REFERENCES

1. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardization of terminology of lower urinary tract function. Report from the Standardization Subcommittee of the International Continence Society. *Neurourol Urodynam* 2002;21:167-78.
2. Farrell SA. Clinical evaluation of the pelvis. In: Drutz HP, Herschorn S, Diamant NE. *Female pelvic medicine and reproductive pelvic surgery*. London: Springer-Verlag; 2003. p. 81-90.
3. Woolf SH, Battista RN, Angerson GM, Logan AG, Eel W. *Canadian Task Force on the Periodic Health Exam*. Ottawa: Canada Communication Group; 1994. p. xxxvii.
4. Jensen JK, Neilsen FR Jr, Ostergard DR. The role of patient history in the diagnosis of urinary incontinence. *Obstet Gynecol* 1994;83:904-10.
5. Bent AE. Pathophysiology. In: Bent AE, Ostergard DR, Cundiff GW, Swift SE, editors. *Ostergard's urogynecology and pelvic floor dysfunction*. 5th ed. Philadelphia: Lippincott, Williams and Wilkins; 2003. p. 43-50.
6. Karram MM, Bhatia NW. The Q-tip test: standardization of the technique and its interpretation in women with urinary incontinence. *Obstet Gynecol* 1988;71:807-11.

7. Lucente V. Anatomic investigation – ultrasound investigation. In: Benson JT, editor: Female pelvic floor disorders. New York: Norton Medical Books; 1992. p. 92–9.
8. Koelbl H, Hanzai E, Bernascheck G. Sonographic urethrocytography – methods and application in patients with genuine stress incontinence. *Int Urogynecol J* 1991;2:25–31.
9. Rezapour M, Falconer C, Ulmsten U. Tension-free vaginal tape (TVT) in stress incontinent women with intrinsic sphincter deficiency (ISD) – a long-term follow-up. *Int Urogynecol J* 2001;(Supp 2):S12–4.
10. Summit RL, Bent AE, Ostergard DR, Harris JA. Stress incontinence and low urethral closure pressure. Correlation of preoperative urethral hypermobility with successful suburethral sling procedures. *J Reprod Med* 1990;35:877–80.
11. Bates P, Bradley WE, Glen E, Melchion H, Rowan D, Sterling A, et al. First report on standardization of terminology of lower urinary tract function. Urinary incontinence. Procedures related to evaluation of urine storage: cystometry, urethral closure pressure profile, units of measurement. *Br J Urol* 1976;48:39–42. *Eur Urol* 1976;2:274–6. *Scand J Urol Nephrol* 1976;11:193–6. *Urol Int* 1976;32:81–7.
12. Marks LS, Dorey FJ, Macairan ML, Park C, de Kernion JB. Three-dimensional ultrasound device for rapid determination of bladder volume. *Urology* 1997;50:341–8.
13. Alnaif B, Drutz HP. The accuracy of portable abdominal ultrasound equipment in measuring postvoid residual volume. *Int Urogynecol J* 1999;10:215–8.
14. Goode PS, Locher JL, Bryant RL, Roth DL, Burgio KL. Measurement of postvoid residual urine with portable transabdominal ultrasound scanner and urethral catheterization. *Int Urogynecol J* 2000;11:296–300.
15. Ribeiro RM, Rossi P, Guidi HGC, Pinotti JA. Urinary tract infections in women. *Int Urogynecol J* 2002;13:198–203.
16. Silva VVA, Farrell SA. The predictive value of urinalysis for UTI. Proceedings of the Annual Scientific Meeting of the American Urogynecologic Society; 2002 October 17–19; San Francisco, California. p. 86.
17. Glazener CMA, Lapitan MC. Urodynamics investigations for the management of urinary incontinence in adults (Cochrane Review). In: The Cochrane Library, Issue 3. Oxford: Update Software; 2002.
18. Rezapour M, Ulmsten U. Tension-free vaginal tape (TVT) in women with mixed urinary incontinence – a long-term follow-up. *Int Urogynecol J* 2001;(Suppl 2):S15–8.
19. Colombo M, Zoretta G, Vitobello D, Milani R. The Burch colpo-suspension for women with and without detrusor overactivity. *Br J Obstet Gynaecol* 1996;103:255–60.
20. Sand PK, Winther H, Blackhurst DW, Culligan PJ. A prospective randomized study comparing modified Burch retropubic urethropexy and suburethral sling for the treatment of genuine stress incontinence with low-pressure urethra. *Am J Obstet Gynecol* 2000;182:30–4.
21. Weber AM, Walters MD. Cost-effectiveness of urodynamics testing before surgery for women with pelvic organ prolapse and stress urinary incontinence. *Am J Obstet Gynecol* 2000;183:1338–47.
22. Agency for Health Care Policy and Research. Clinical practice guideline: urinary incontinence in adults. Washington: Department of Health and Human Services (US), Agency for Health Care Policy and Research; 1992.
23. Mortenson S, Lose G, Thysson H. Repeatability of cystometry and pressure-flow parameters in female patients. *Int Urogynecol J* 2002;13:72–5.
24. Lose G, Broström S. Low-pressure urethra in women: what does it mean and what can it be used for? *Int Urogynecol J* 2002;13:215–7.
25. Verecken RL. A critical view on the value of urodynamics in non-neurogenic incontinence in women. *Int Urogynecol J* 2000;11:188–95.