

Urinary incontinence

Non-surgical management by family physicians

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ABSTRACT

OBJECTIVE To review current evidence on conservative management of urinary incontinence (UI) by family physicians.

QUALITY OF EVIDENCE Articles were sought through MEDLINE, EMBASE, Cochrane Database of Systematic Reviews, CINAHL, PsycLit, ERIC, two consensus meetings, and review of abstracts presented at urology meetings. References of these articles were searched for relevant trials. Strong evidence supports bladder training, pelvic floor exercises, and some medications, but only fair evidence supports fluid adjustment, caffeine reduction, and stopping smoking. Weight loss and exercise are supported by expert opinion only. Consensus opinion is that, whenever possible, conservative management should be considered first.

MAIN MESSAGE Good evidence shows that initial management by primary care physicians is effective. After basic assessment and tests, strategies such as bladder retraining, pelvic floor exercises, and lifestyle modifications, augmented by appropriate medications, can be successful. If initial strategies are unsuccessful, patients can be referred.

CONCLUSION More than a million Canadians suffer from UI. In almost all cases, family physicians are the first health professionals contacted by patients. Basic assessment and conservative management can go far to ameliorate the problem.

RÉSUMÉ

OBJECTIF Passer en revue les données actuelles sur le rôle du médecin de famille dans le traitement conservateur de l'incontinence urinaire (IU).

QUALITÉ DES PREUVES On a utilisé MEDLINE, EMBASE, Cochrane Database of Systematic Reviews, CINAHL, PsycLit, ERIC, deux congrès de consensus et l'examen des résumés de communications d'un congrès d'urologie comme sources de données. Les références bibliographiques des articles retenus ont été examinées pour identifier les essais thérapeutiques pertinents. Les méthodes fondées sur des preuves solides incluent la rééducation vésicale, le renforcement du plancher pelvien et certaines médicaments; par contre, l'ajustement des liquides, la réduction de la caféine et l'arrêt du tabac sont moins bien appuyés scientifiquement. La réduction du poids et l'exercice sont recommandés seulement par les experts. Le consensus général est qu'on doit débiter par un traitement conservateur chaque fois que possible.

PRINCIPAL MESSAGE Les données montrent clairement que le médecin de première ligne peut effectuer le traitement initial efficacement. Après l'évaluation et les examens de base, des méthodes comme la rééducation vésicale, le renforcement des muscles du plancher pelvien et les modifications du mode de vie peuvent avoir du succès. En cas d'échec de ces stratégies, le patient peut être dirigé en spécialité.

CONCLUSION Plus d'un million de canadiens souffrent d'IU. Dans presque tous les cas, le médecin de famille est le premier professionnel de santé consulté. Une évaluation de base et un traitement conservateur peuvent faire beaucoup pour améliorer ce problème.

This article has been peer reviewed.

Cet article a fait l'objet d'une évaluation externe.

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A national Angus Reid poll noted that 1.5 million Canadians (7%) had suffered from urine loss in the previous year and that the prevalence increased with age to 12% of women and 2.5% of men older than 55. At least 16% of seniors living at home need assistance for urinary incontinence (UI).¹ People with UI report restrictions on physical activity,^{2,3} stress, frustration, thoughts of suicide,⁴ confusion, depression, anger, less well-being,⁵ low self-esteem, social isolation, and poor sleep.^{6,7} Family physicians are the first contact for most people with UI; initial assessment and intervention for UI by family physicians is effective and long lasting.⁸⁻¹⁰

Despite the prevalence of UI and the fact that family physicians are the first point of entry, recent graduates of family practice residency training in Ontario stated they received inadequate training in assessment and management of UI.¹¹ In this paper, we review available evidence and describe initial assessment and conservative management of UI. Conservative management in this article means lifestyle adjustments and pelvic floor muscle exercises (PFME) with or without medications.

Quality of evidence

The Cochrane Database, MEDLINE, CINAHL, EMBASE, PsycLit, and ERIC were searched from January 1995 to January 2001. Because an authoritative literature review was done in 1994,¹² we chose 1995 as the start date for our search. We used the search terms incontinence, electrical stimulation, bio-feedback, pelvic muscle/Kegel exercises, behaviour/modification, conservative, physiotherapy, and quality of life. Consensus documents,¹²⁻¹⁶ conference proceedings, and all reference lists of articles retrieved were consulted. Levels of evidence follow the recommendations of the Canadian Medical Association.¹⁷

Classification of UI

At presentation, UI is classified by symptoms. Cause is presumed rather than confirmed and is described as urge (or overactive bladder), stress, mixed urge and stress, or retention with overflow. Definitive diagnosis requires a detailed, expert assessment, usually including urodynamics.

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Because the bladder can be an “unreliable witness,”^{18,19} if initial strategies are ineffective, referral to a specialist is indicated. **Table 1** summarizes symptoms, presumed cause, and usual treatment strategies at the primary care level.

Assessment

A plan for initial assessment of patients with UI was recently suggested.²⁰ It emphasized sensitive questioning about the effect of UI on daily life; detailed history; focused pelvic, rectal, and neurologic examinations; urinalysis (microscopy or dipstick); using a voiding diary; and assessing postvoid residual (PVR) volume, if indicated (**Table 2**²⁰). Although most guidelines for UI recommend initial PVR testing,¹² the value in family practice has only recently been investigated. In a study of 408 women who came to an incontinence clinic for initial assessment, only six had clinically significant residual urine; the authors concluded that a PVR test is unnecessary in primary assessment of women with UI.²¹

Vaginal or rectal examination can be used to assess pelvic floor muscle tone, sensation, contractile ability, and atrophic changes. A fluid volume chart (voiding diary, **Figure 1**) is easy for most patients to complete²² and can be used to assess voiding patterns and fluid intake over 1 to 3 days. A voiding diary can reliably discriminate between urge and stress UI²³: patients with stress UI usually wake once or not at all to void; patients with urge UI usually wake more than twice and as often as every hour. A dietary and stool record is helpful if constipation or fecal soiling are problems.

Several transient problems exacerbate UI: urinary tract infections, constipation, dementia or delirium, atrophic vaginitis, and medications. Medications that most frequently cause problems are α -blockers, which relax the smooth muscle of the bladder neck and worsen stress UI.²⁴ In at-risk patients, angiotensin-converting enzyme inhibitors can cause a dry cough that also exacerbates stress UI.²⁵ Finally, hypnotics, some antipsychotics, narcotics, and anticholinergics put people at risk of urinary retention. Patients who develop UI after a medication change should be reviewed for side effects.

Conservative management

Conservative management (also called behavioural strategies or lifestyle adjustments) is noninvasive and includes PFMEs, bladder training, fluid adjustment, caffeine elimination, smoking cessation, bowel management, weight reduction, and physical exercise.

Table 1. Symptom presentation and usual treatment strategies in primary care

PRESUMED CAUSE	DESCRIPTION	TREATMENTS OFFERED THROUGH PRIMARY CARE
Overactive bladder, urge incontinence	Loss of urine associated with a strong desire to void; might be accompanied by frequency and nocturia; nocturia is typically described by patients with overactive bladder but not by those with stress UI	Bladder training, timed toileting, fluid management, medication review Constipation management PFME and PFME with biofeedback Electrical stimulation (10-20 Hz) Estrogen therapy Anticholinergic or antimuscarinic medications Incontinence pads Environmental modifications, such as bedside commodes, night lights, and clearly marked toilets
Stress UI	Loss of urine on physical exertion or increases in abdominal pressure due to laughing, coughing, or sneezing, or due to sphincter deficiency; patients with stress UI are usually dry at night and do not complain of nocturia	Weight loss Fluid increase or decrease Smoking cessation Constipation management PFME and PFME with biofeedback Pessary (occasionally) Incontinence pads
Mixed UI (overactive bladder and stress UI)	Loss of urine with both urge and increases in abdominal stress; symptoms are mixed with urgency, frequency, nocturia, and leaking with increased abdominal pressures	Combination of above conservative measures with an initial focus on dominant symptom
Overflow	Leakage associated with bladder distension or urinary retention; leakage with increased abdominal pressure; might be confused with stress UI; due to a contractile or poorly contractile detrusor or outlet obstruction; chronic retention is usually painless	Refer Clean intermittent catheterization Relief of obstruction (in women, cystocele, uterine prolapse, tumour; in men, prostatic enlargement hyperplasia, urethral stricture, bladder tumour) Medication review α -Blockers Last resort: indwelling catheter

PFME—pelvic floor muscle exercises, UI—urinary incontinence.

Table 2. Clinical assessment of patients with urinary incontinence

INVESTIGATION	DESCRIPTION
Focused neurologic examination	General assessment of sacral (S2-5) dermatomes: evaluates perineal and saddle sensation, rectal tone and sensation, and ability of rectal sphincter to remain contracted with stimulus of digital examination; abnormalities suggest some neurologic impairment and possibly referral to a neurologist
Rectal or vaginal examination	Rectal examination will reveal prostate enlargement, stool impaction (which might affect continence), and rectal tone and sensation (above); vaginal examination will reveal atrophic vaginitis, cystocele, uterine prolapse, rectocele, and pelvic floor tone when patient coughs or strains. A rectocele does not cause urinary incontinence; however, stool can collect in the rectocele and might need to be evacuated manually or by placing a finger in the vagina or on the perineum to provide resistance while defecating. Such maneuvers can be embarrassing. Referral to a gynecologist or urogynecologist is indicated if methods to reduce stool pocketing, such as stool softeners, fibre, and lubricants, are ineffective
Postvoid residual test with ultrasound scan or in-out catheterization (generally >150 mL is considered significant, but treatment should be based on symptoms rather than PVR volume alone) ²⁰	Recommended if symptoms suggest incomplete emptying typically described as straining to void, intermittent stream or hesitancy, and for some, never feeling empty or leaking with increased abdominal pressure Physical examination might reveal distended bladder but abdominal palpation might be accurate only when bladder is grossly distended Patients at risk for incomplete emptying are those with neurologic diseases (eg, multiple sclerosis), history of urethral strictures, peripheral neuropathies (diabetes, alcohol abuse, B ₁₂ deficiency), or medications with anticholinergic properties. Women with uterine prolapse or marked cystocele and men with prostatic hyperplasia are at risk. Patients with symptoms and PVR volume can be managed initially with α -blockers or intermittent catheterization. Referral to a urologist is indicated if symptoms persist.

PVR—postvoid residual.

For more strategies, see Borrie and Valiquette.²⁰

Figure 1. Fluid volume chart

Date: _____ Name: _____

TIME	AMOUNT VOIDED	LEAKAGE? (YES OR NO)	LIQUID INTAKE	COMMENTS
6-8 AM				
8-10 AM				
10-12 AM				
12-2 PM				
2-4 PM				
4-6 PM				
6-8 PM				
8-10 PM				
10-12 PM				
Overnight*				
Total in 24 hours	No. of voids	No. of wet pads	Fluid intake	

*Just make a check mark for nighttime voids; no need to measure.

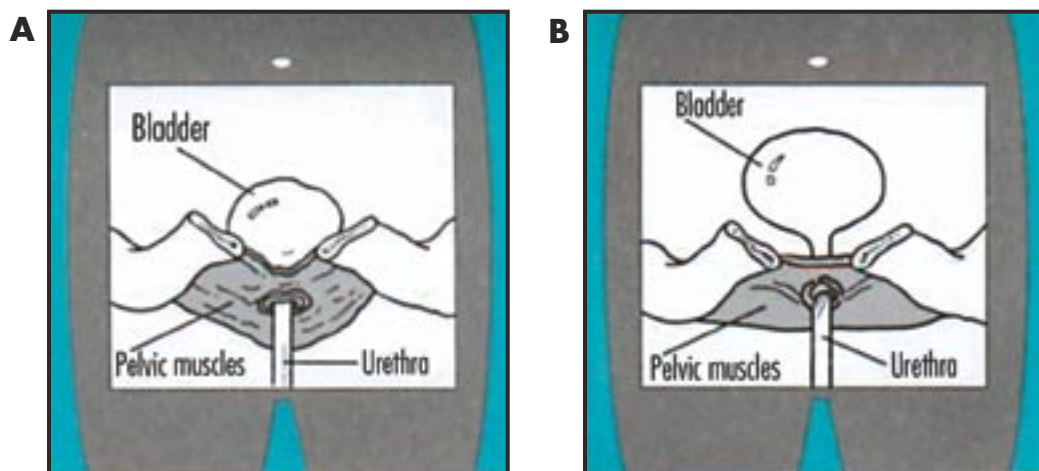
Experts suggest that most people will benefit from and should be offered behavioural strategies as first-line treatment.¹²⁻¹⁶

Pelvic floor muscle exercises. Exercises should increase awareness of pelvic muscle function and increase the strength and endurance of voluntary muscles. The benefits to women without prolapse who follow an intensive exercise regimen are well known²⁶⁻²⁹ and long lasting.^{30,31} Primiparous women who practise PFME have fewer episodes of UI during pregnancy and afterward than controls.³² The benefits of PFMEs in men after radical prostatectomy are not as clear. In a Cochrane review of six randomized controlled trials,³³ only one showed a significant effect of postprostatectomy exercises. Although further research is required,

the reviewers concluded that PFMEs after radical prostatectomy might enhance continence recovery and had several quality-of-life benefits, and that men should not be discouraged from participating in programs should they wish to do so.

Exercises are most effectively taught with vaginal or rectal palpation to help patients identify the correct muscles and timing of contractions. Men should see the base of the penis, pull up and in. Without adequate instruction, between 30% and 70% of patients cannot perform effective PFMEs.³⁴ **Figure 2** shows the PFME illustrations provided by the Canadian Continence Foundation (www.continence-fdn.ca). This basic information is best combined with teaching, support, and ongoing follow up by a physiotherapist or nurse (level I

Figure 2. Pelvic floor muscle exercises: A) Muscles relaxed; B) Muscles contracted.



evidence). Augmenting PFMEs with biofeedback or electrical stimulation^{35,36} might increase the effectiveness of therapy (level II evidence).

Bladder training. Bladder training (also called urge suppression or scheduled voiding) is an important first-line strategy.³⁷ The intent is to increase the voiding interval by consciously suppressing the urge to void; patient education, scheduled voiding, positive reinforcement, and ongoing support are helpful.¹² Keys to success are good sensation of bladder fullness, adequate pelvic muscle tone (assessed by a pelvic examination), motivation, and cognitive ability.

Adding other behavioural methods or short-term anticholinergics³⁸ might increase effectiveness. A recent Cochrane review on bladder training identified seven randomized controlled trials³⁹ that noted improvement in subjects who had participated in bladder training compared with no treatment or no bladder training (level I evidence). **Table 3** outlines a bladder-training protocol.

Fluid adjustment and caffeine reduction. Controlled fluid reduction, such as restricting fluids in the evening, and nighttime toileting might reduce UI symptoms in elderly people.⁴⁰ If fluid intake is low (less than 30 mL/kg), however, increased fluid intake might improve symptoms.⁴¹ Physiologic evidence suggests that caffeine precipitates symptoms of UI,⁴² but clinical evidence of the effectiveness of caffeine

reduction is unclear.^{43,44} In one study, subjects randomly assigned to ingest no caffeine at all had significantly fewer episodes of incontinence (as recorded by bladder diary) than controls⁴⁵ (level II evidence).

Reducing or stopping of cigarette smoking. Smoking is a risk factor for UI in women older than 60 who have chronic obstructive pulmonary disease and chronic respiratory symptoms^{46,47}; in younger women, the relationship is less clear.⁴⁸ Chronic coughing might cause gradual anatomic and pressure transmission defects that could contribute to stress UI.⁴⁹ A retrospective case-control study of women who never smoked and women who currently smoked showed that the relative risk of urge or stress incontinence increased by 2.2 for women who previously smoked and by 2.5 for those who currently smoked. Risk increased with number of cigarettes and years as a smoker.⁵⁰

Men aged 50 to 70 who smoke or are former smokers have an increased risk of lower urinary tract symptoms (odds ratio 1.47 and 1.38, respectively) compared with those who never smoked.⁵¹ No studies were found that measured the effect of smoking cessation on immediate improvement in lower urinary tract symptoms or continence (level II evidence).

Weight reduction. Obesity is a known risk factor for UI in women and is independent of obstetric history, surgery, smoking, and family history.⁵² Defined as

Table 3. Scheduled (timed) voiding for bladder training

1. Establish a voiding pattern by using a bladder diary (fluid volume chart) to record number and volume of voids, incontinence episodes, and fluid intake.
2. Determine a voiding interval based on the voiding pattern. If frequency is more than every 60 minutes, void every 60 minutes; if less than 60 minutes, start with 30-minute intervals. After 2 days without incontinence, increase time between voids by 30 minutes. Continue this process until voiding every 3 to 4 hours.
3. Teach urge suppression. Pelvic muscle exercises and distraction techniques can help dissipate the urge to void. To control the urge, take a deep breath and relax. Stand still or sit down. Contract your pelvic floor muscles five or six times. Count backward from 100. Concentrate on having the urge decrease. Wait until it passes, and then resume your activities. If it is longer than 2 hours since last void, proceed slowly to the toilet to empty your bladder. Rushing to the toilet will make symptoms of urgency much worse.
4. Gradually increase length of time between voids as continence is achieved.
5. Record progress on fluid volume chart or bladder diary. A daily or weekly bladder diary helps to track progress.
6. Follow up regularly. Bladder retraining requires a lot of work and commitment. Encouragement is important for success. Successful bladder retraining can take several weeks.

greater than 120% of the average weight for height and age, obesity is significantly more prevalent in women with stress UI and overactive bladder than in the general population.⁵³ Women with profound weight loss after bypass surgery report a marked improvement in stress UI.⁵⁴ Results of more modest weight-loss programs are not reported¹³ (level II evidence for profound weight loss, level III evidence for modest weight loss).

Bowel management. Growing evidence links UI, constipation, fecal incontinence, and pelvic organ prolapse with each other and each of these conditions, in turn, to pelvic floor denervation, pudendal neuropathy, and progressive chronic dysfunction.⁵⁵⁻⁵⁷ Constipation can cause bladder neck obstruction and obstructive voiding⁵⁸; fecal incontinence can cause

social isolation far beyond that of UI and remains a taboo topic.⁵⁹ Referral is required if initial dietary and nonstimulant bowel preparations are ineffective in ameliorating constipation or fecal incontinence (level III evidence).

Physical activity and regular exercise. Men aged 40 to 75 who undertake moderate exercise (walking 2 to 3 hours weekly) have a 25% lower risk of benign prostatic hyperplasia than men who do not exercise,⁶⁰ but there are no similar studies in women. People limit their activities or stop exercising because of UI, thereby increasing the risk of other weight-related problems (level III evidence).

Medications

Table 4 describes medications commonly prescribed for UI. Good evidence shows that treatment with the anticholinergic medications oxybutynin and tolterodine results in increased bladder capacity, increased time between urge to void, and delayed initial desire to void.⁶¹ Oxybutynin as low as 2.5 mg at bedtime is effective, particularly for elderly patients. Increasing the dose gradually by 2.5 mg until tolerance is reached reduces side effects and increases the likelihood that patients will continue the medication. Side effects are the main reason for discontinuing the drug, particularly xerostomia, which places patients at risk of dental caries; mouth moisturizers plus regular dental care are important. Tolterodine is consistently reported to have fewer side effects than oral oxybutynin.⁶² Both oxybutynin and tolterodine extended-release formats are reported to have fewer side effects with once-a-day dosing (level I evidence).

Finally, local treatment of urogenital atrophy with low-dose estrogen appears to have clinical benefit for postmenopausal women experiencing urgency, urge UI, vaginal dryness, and dyspareunia. A recent Cochrane review⁶³ showed that women with symptoms of overactive bladder had marked improvement in nocturia, urgency, and daytime frequency, but little benefit was found for women with stress UI. Doses and administration varied in the studies, but topical, intermittent estrogen or sustained-release estradiol appeared to be as effective as oral or patch medication in relieving symptoms. Excessive use of topical creams can result in systemic effects, but when used as directed, effects are minimal. In low doses, the additional systemic benefits of estrogens are probably minimal, but because of the low dose, endometrial stimulation is unlikely, and progestin protection is seldom necessary (level I evidence for relief of urge symptoms).

Table 4. Pharmacologic therapies for bladder function: Dosage, pharmacokinetics, and common side effects.

CLASSIFICATION	GENERIC DRUG NAME	MECHANISM OF ACTION	CONTRAINDICATIONS	DOSE AND HALF-LIFE	SIDE EFFECTS
Anticholinergics and antimuscarinics (level I evidence)	Oxybutynin Oxybutynin XL	Antispasmodic and slight analgesic effect on smooth muscle; inhibits acetylcholine effects on smooth muscle All are metabolized primarily by cytochrome P-450-3A4	As for all anticholinergic medications: narrow-angle glaucoma; gastrointestinal obstruction or atony; ulcerative colitis, myasthenia gravis; urinary retention or PVR volume (can be used in conjunction with intermittent catheterization)	2.5-5 mg one to four times daily; half-life elimination 1-3 h; time to peak 60 min; onset 30-60 min, peak effect 3-6 h; lipophilic, crosses blood-brain barrier Oxybutynin XL takes 4-6 hrs to reach peak; steady state achieved in about 3 days; available in 5 and 10 mg	Constipation, dry mucosa (mouth, vagina, eyes); in elderly people, confusion, decreased cognition (drug crosses blood-brain barrier); blurred vision; can result in urinary retention. At-risk patients should be monitored for PVR volume (Table 2). Note: gradually increasing oral dose increases tolerance, especially among elderly people; doses as low as 2.5 mg at bedtime are effective for some elderly patients.
	Tolterodine Tolterodine LA	More selective on M3 receptors than oxybutynin, resulting in fewer anticholinergic side effects	As above, but adjust dosage if concurrent use of cytochrome P-450-3A4 inhibitors (fluoxetine increases concentration 4.8 times)	1-2 mg twice daily; could take up to 8 wk to reach optimum benefit; tolterodine LA 4 mg	Warn patients that the empty capsule from oxybutynin LA will be excreted in the feces As above but less because of selectivity of M3 bladder receptors over salivary receptors
Tricyclic antidepressants (level II evidence)	Imipramine, doxepin, desipramine, nortriptyline		Decrease in nocturnal incontinence; side effects common	25 mg at bedtime; up to 25 mg three times daily Half-life 6-18 h	As above; occasional orthostatic hypotension
Hormone replacement therapy (level I evidence)	Conjugated estrogen vaginal cream Slow-release estradiol ring	Reduces irritation from atrophic vaginitis Note: Dose is too low to provide systemic benefits of estrogen therapy	Generally contraindicated in women with history of endometrial, ovarian, or breast cancer	Cream: 1-2 g at bedtime for 2 wk, then twice weekly at bedtime Estradiol ring: change every 3 mo	Might cause sore breasts or spotting; must be applied intravaginally, not on labia

M3—muscarinic, PVR—postvoid residual.

Conclusion

Urinary incontinence is a common health problem that seriously affects patients' lives. Although family physicians are often patients' first contact, physicians feel unprepared to address the issue of UI, and both parties feel disappointed. Consensus opinion and clinical trials suggest that conservative management is safe, effective, and can be offered through primary care. Referral is indicated if symptoms do not resolve with initial interventions or if symptoms suggest underlying urologic or gynecologic problems. The best available evidence supports family physicians as pivotal in identifying patients with UI, initiating discussion, beginning assessment, and implementing basic management strategies. ❁

Competing interests

None declared

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References

1. Angus Reid poll. *Urinary incontinence in the Canadian adult population. Survey commissioned by the Canadian Continence Foundation.* Toronto, Ont: Angus Reid Group; 1997.
2. Herr H. Quality of life in incontinent men after radical prostatectomy. *J Urol* 1994;151:652-4.
3. Jonler M, Madsen FA, Rhodes PR, Sall M, Messing EM, Bruskewitz RC. A prospective study of quantification of urinary incontinence and quality of life in patients undergoing radical retropubic prostatectomy. *Urology* 1996;48:433-40.
4. Moore KN, Estey A. The early post-operative concerns of men after radical prostatectomy. *J Adv Nurs* 1999;29:1121-9.
5. Chiverton PA, Wells TJ, Brink CA, Mayer R. Psychological factors associated with urinary incontinence. *Clin Nurse Spec* 1996;10:229-33.
6. Grimby A, Milsom I, Molander U, Wiklund I, Ekelund P. The influence of urinary incontinence on the quality of life of elderly women. *Age Ageing* 1993;22:82-9.
7. Hunksaar S, Visnes A. The quality of life in women with urinary incontinence as measured by the Sickness Impact Profile. *J Am Geriatr Soc* 1991;39:378-82.
8. Lagro-Janssen AL, Debruyne FM, Smits AJ, van Weel C. The effects of treatment of urinary incontinence in general practice. *Fam Pract* 1992;9:284-9.
9. Lagro-Janssen AL, van Weel C. Long-term effect of treatment of female incontinence in general practice. *Br J Gen Pract* 1998;48:1735-8.
10. Seim A, Hermstad R, Hunksaar S. Management in general practice significantly reduced psychosocial consequences of female urinary incontinence. *Qual Life Res* 1997;6:257-64.
11. Shultz JA, Klag M, Drutz HP. A survey of Canadian family physician training in pelvic floor dysfunction [abstract]. *Int Urogynecol J* 2000;11(Suppl 1):S78.
12. Agency for Health Care Policy and Research. *Urinary incontinence in adults: acute and chronic management. A clinical practice guideline. Update.* Rockville, Md: US Department of Health and Human Services; 1996. Publication 96-0862.
13. Wilson PD, Bo K, Bourcier A, Hay-Smith J, Staskin D, Nygaard I, et al. Conservative management in women. In: Abrams P, Khoury S, Wein A, editors. *Incontinence: 1st International Consultation on Incontinence, Monaco, 1998.* Plymouth, Engl: Plymbridge Distributors Ltd; 1999. p. 581-636.
14. Canadian Continence Foundation. *Canadian Continence Foundation consensus conference on clinical practice guidelines and models for delivery of continence care in Canada.* Sponsored by the Canadian Continence Foundation. Montreal, Que; May 2000. Available at: <http://continence-fdn.ca>. Accessed 2003 February 11.
15. Bo K, Stien R, Kulseng-Hanssen S, Kristofferson M. NIH Consensus Development Panel: urinary incontinence in adults. *JAMA* 1989;261:2685-90.

Editor's key points

- Initial evaluation of urinary incontinence (UI) includes a focused physical examination, urine tests, and a voiding diary.
- Postvoid residual urine must be evaluated when patients have symptoms, when physical examination reveals signs, or when there are infections associated with incomplete voiding (eg, a feeling of never having really emptied the bladder, distended bladder, diabetes).
- Exercises to strengthen the muscles of the pelvic floor and programs to retrain the bladder are the nonpharmacologic interventions most strongly supported by evidence in the scientific literature.
- Anticholinergic drugs (tolterodine, oxybutynin) are the pharmacologic agents that have been shown to be efficacious.

Points de repère du rédacteur

- L'évaluation initiale d'un problème d'incontinence urinaire inclut un examen physique ciblé, un examen sommaire des urines et un journal des mictions.
- Le résidu vésical postmictionnel doit être évalué en présence de symptômes, de signes à l'examen physique ou de pathologies associées à une vidange vésicale incomplète (ex: sensation de ne jamais parvenir à vider la vessie, globe vésical, diabète).
- Les exercices de renforcement des muscles pelviens et les programmes de rééducation vésicale sont les interventions non pharmacologiques dont l'efficacité est la plus solidement appuyée scientifiquement.
- Les anticholinergiques (toltérodine et oxybutynine) sont des agents pharmacologiques dont l'efficacité est bien démontrée.

16. Wilson PD, Bo K, Boureier A, Hay-Smith J, Staskin D, Nygaard I, et al. Conservative management in women. In: Abrams P, Khoury S, Wein A, editors. *Incontinence: 1st International Consultation on Incontinence, Monaco, 1998.* Plymouth, Engl: Plymbridge Distributors Ltd; 1999. p. 579-636.
17. Patterson CJ, Gauthier S, Bergman H, Cohen CA, Feightner JW, Felman H, et al. The recognition, assessment and management of dementing disorders: conclusions from the Canadian Consensus Conference on Dementia. *Can Med Assoc J* 1999;160(2 Suppl):S1-15.
18. Blaivas JG. The bladder is an unreliable witness. *NeuroUrol Urodyn* 1996;15:443-5.
19. Ding YY, Lieu PK, Choo PW. Is the bladder "an unreliable witness" in elderly males with persistent lower urinary tract symptoms? *Geriatr Nephrol Urol* 1997;7:17-21.
20. Borrie MJ, Valiquette L. Managing adults with urinary incontinence. Clinical practice guidelines. *Can Fam Physician* 2002;48:114-6.
21. Sander P, Mouritsen L, Thorup-Andersen J, Fischer-Rasmussen W. Should measurement of maximum urinary flow rate and residual urine volume be a part of a 'minimal care' assessment program in female incontinence? *Scand J Urol Nephrol* 2002;36:124-7.
22. Robinson D, McClish DK, Wyman JF, Bump RC, Fantl JA. Comparison between urinary diaries completed with and without intensive patient instructions. *NeuroUrol Urodyn* 1996;15:143-8.
23. Fink D, Perucchini D, Scherj GN, Haller U. The role of the frequency-volume chart in the differential diagnostic of female urinary incontinence. *Acta Obstet Gynecol Scand* 1999;78:254-7.

24. Marshall HJ, Beevers DG. Alpha-adrenoceptor blocking drugs and female urinary incontinence: prevalence and reversibility. *Br J Clin Pharmacol* 1996;42:1507-9.
25. Menefee SA, Chesson R, Wall LL. Stress urinary incontinence due to prescription medications: alpha-blockers and angiotensin converting enzyme inhibitors. *Obstet Gynecol* 1998;91:853-4.
26. Bø K, Talseth T, Holme I. Single blind randomized controlled trial of pelvic floor exercises, electrical stimulation, vaginal cones or no treatment in management of genuine stress incontinence in women. *BMJ* 1999;318:487-93.
27. Sampsel C, Wyman J, Thomas K, Newman D, Gray M, Dougherty M, et al. Continence for women: evaluation of AWHONN's evidence-based protocol. *J Obstet Gynecol Neonat Nurs* 2000;29:18-26.
28. Wyman J, Fantl A, McClish D, Bump R. Comparative efficacy of behavioral interventions in the management of female urinary incontinence. *Am J Obstet Gynecol* 1998;179:999-1007.
29. Miller J, Aston-Miller J, Delancey J. A pelvic muscle precontraction can reduce cough-related urine loss in selected women with mild SUI. *J Am Geriatr Soc* 1998;46:870-4.
30. Bø K, Talseth T. Long-term effect of pelvic floor muscle exercise 5 years after cessation of organized training. *Obstet Gynecol* 1996;87:261-5.
31. O'Brien J. Evaluating primary care interventions for incontinence. *Nurs Stand* 1996;10:40-3.
32. Laycock J. Clinical evaluation of the pelvic floor. In: Schessler B, Laycock J, Norton P, Stanton S, editors. *Pelvic floor re-education: principles and practice*. London, Engl: Springer-Verlag; 1994. p. 42-8.
33. Moore KN, Cody DJ, Glazener CM. Conservative management of post prostatectomy incontinence (Cochrane Review). In: *The Cochrane Library* [database on disk and CD-ROM]. Issue 1. Oxford, Engl: Update Software; 2002.
34. Bø K, Larson S, Oseid S, Kvarstein B, Hagen R, Jørgensen J. Knowledge about and ability to correct pelvic floor muscle exercises in women with urinary stress incontinence. *NeuroUrol Urodyn* 1988;7:261-2.
35. Bø K. Vaginal weight cones. Theoretical framework, effect on pelvic floor muscle strength and female stress urinary incontinence. *Acta Obstet Gynecol Scand* 1995;74:87-92.
36. Herbison P, Plevnik S, Mantle J. Weighted vaginal cones for urinary incontinence (Cochrane Review). In: *The Cochrane Library* [database on disk and CD-ROM]. Issue 2. Oxford, Engl: Update Software; 2000.
37. Wyman JF, Fantl JA. Bladder training in ambulatory care management of urinary incontinence. *Urol Nurs* 1991;11:11-7.
38. Szonyi G, Collas DM, Ding YY, Malone-Lee JG. Oxybutynin with bladder retraining for detrusor instability in elderly people: a randomized controlled trial. *Age Ageing* 1995;24:287-91.
39. Roe B, Williams K, Palmer M. Bladder training for urinary incontinence in adults (Cochrane Review). In: *The Cochrane Library* [database on disk and CD-ROM]. Issue 4. Oxford, Engl: Update Software; 1999.
40. Griffiths DJ, McCracken PN, Harrison GM, Gormley EA. Relationship of fluid intake to voluntary micturition and urinary incontinence in geriatric patients. *NeuroUrol Urodyn* 1993;12:1-7.
41. Dowd TT, Campbell JM, Jones JA. Fluid intake and urinary incontinence in older community-dwelling women. *J Community Health Nurs* 1996;13:179-86.
42. Creighton SM, Stanton SL. Caffeine: does it affect your bladder? *Br J Urol* 1990;66:613-4.
43. Tomlinson BU, Dougherty MC, Pendergast JF, Boyington AR, Coffman MA, Pickens SM. Dietary caffeine, fluid intake and urinary incontinence in older rural women. *Int Urogynecol J Pelvic Floor Dysfunct* 1999;10:22-8.
44. Fried GW, Goetz G, Potts-Nulty S, Cioschi HM, Staas WE Jr. A behavioral approach to the treatment of urinary incontinence in a disabled population. *Arch Phys Med Rehabil* 1995;76:1120-4.
45. Bryant CM, Dowell CJ, Fairbrother G. A randomised trial of the effects of caffeine upon frequency, urgency and urge incontinence. *NeuroUrol Urodyn* 2000;19:501-2.
46. Diokno AC, Brock BM, Herzog AR, Bromberg J. Medical correlates of urinary incontinence in the elderly. *Urology* 1990;36:129-38.
47. Brown JS, Seeley DG, Fong J, Black DM, Ensrud KE, Grady D. Urinary incontinence in older women: who is at risk? Study of the Osteoporotic Fractures Research Group. *Obstet Gynecol* 1996;87:715-21.
48. Burgio KL, Matthews KA, Engel BT. Prevalence, incidence and correlates of urinary incontinence in healthy, middle-aged women. *J Urol* 1991;146:1255-9.
49. Bump RC, McClish DK. Cigarette smoking and pure genuine stress incontinence of urine: a comparison of risk factors and determinants between smokers and non-smokers. *Am J Obstet Gynecol* 1994;170:579-82.
50. Bump RC, McClish DK. Cigarette smoking and urinary incontinence in women. *Am J Obstet Gynecol* 1992;167:1213-8.
51. Koskimaki J, Hakama M, Huhtala H, Tammela TL. Association of smoking with lower urinary tract symptoms. *J Urol* 1998;159:1580-2.
52. Wingate L, Wingate MB, Hassanein R. The relation between overweight and urinary incontinence in postmenopausal women: a case control study. *J North Am Menopaus Soc* 1994;1:199-203.
53. Dwyer PL, Lee ETC, Hay DM. Obesity and urinary incontinence in women. *Br J Obstet Gynaecol* 1988;95:91-6.
54. Bump RC, Sugeran HJ, Fantl JA, McClish DK. Obesity and lower urinary tract function in women: effect of surgically induced weight loss. *Am J Obstet Gynecol* 1992;167:392-9.
55. Jackson SL, Weber AM, Hull TL, Mitchinson AR, Walters MD. Fecal incontinence in women with urinary incontinence and pelvic organ prolapse. *Obstet Gynecol* 1997;89:423-7.
56. Pannek J, Haupt G, Sommerfeld HJ, Schulze H, Senge T. Urodynamic and rectomanometric findings in urinary incontinence. *Scand J Urol Nephrol* 1996;30:457-60.
57. Smith AR, Hosker GL, Warrell DW. The role of pudendal nerve damage in the aetiology of genuine stress incontinence in women. *Br J Obstet Gynaecol* 1989;96:29-32.
58. MacDonald A, Shearer M, Paterson PJ, Finlay IG. Relationship between outlet obstruction constipation and obstructed urinary flow. *Br J Surg* 1991;78:693-5.
59. Saltmarche A, Reid DW, Linton L. *Rural continence management project. Research report submitted to the Assistive Devices Program, Ontario Ministry of Health*. Toronto, Ont: Ontario Ministry of Health; 1992.
60. Platz EA, Kawachi I, Rimm EB, Colditz GA, Stampfer JF, Willett WC, et al. Physical activity and benign prostatic hyperplasia. *Arch Intern Med* 1998;158:2349-56.
61. Harvey MA, Baker K, Wells GA. Tolterodine versus oxybutynin in the treatment of urge urinary incontinence: a meta-analysis. *Am J Obstet Gynecol* 2001;185:56-61.
62. Herbison PG, Ellis G, Hay-Smith J, Moore K. Anticholinergic drugs for overactive bladder syndrome in adults (Cochrane Review) The Cochrane Library. Oxford, Engl: Update Software Ltd; 2003. Issue 1.
63. Moehrer B, Hextall A, Jackson S. Oestrogens for urinary incontinence in women (Cochrane Review). In press.