An evidence-based strategy for the conservative management of the male patient with incontinence

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Purpose of review
Incontinence is not an isolated symptom in men, but rather a component of a multifactorial problem that may include other lower urinary tract symptoms (LUTS). Male urinary incontinence is often seen following prostate surgery and procedures, particularly prostate cancer surgery. Men with enlarged prostates experience overactive bladder symptoms of urgency and frequency. Despite these bothersome lower urinary tract problems in men, conservative treatment remains poorly investigated. This review will provide the current evidence-based strategies for the use of conservative management in men with urinary incontinence and other LUTS.

Recent findings
Conservative treatment for urinary incontinence is an effective intervention and has been recommended by the evidence-based guidelines as the first-line intervention for LUTS. Despite this prevalence, the only population of men who continue to receive systematic consideration with respect to conservative management are those with postprostatectomy urinary symptoms. Although continence status gradually improves in the ensuing weeks and months, evidence-based research has shown that preoperative and early postoperative pelvic floor muscle training can speed the recovery of continence in the short and long term. Recent research has also shown that behavioral therapy combined with medication can improve the male symptom of nocturia. Lifestyle changes of weight loss in obese men with diabetes and LUTS and dietary modification has also been shown to be effective.

Summary
Although sparse, there are data to support conservative interventions as the first-line treatment in men with LUTS. There is a strong recommendation for implementing a pelvic floor muscle training (PFMT) program before and after prostatectomy. Positive lifestyle changes such as weight loss in obese men and dietary modification can lessen urgency, nocturia, and incontinence. Despite this growing evidence on effectiveness, urologists rarely recommend conservative treatment to patients.

Keywords
conservative treatment, evidence-based research, frequency, lower urinary tract symptoms, male urinary incontinence, pelvic floor muscle training, urgency

INTRODUCTION

Urinary incontinence affects a substantial proportion of men. Estimated prevalence varies from 11% among those aged 60–64 years to 31% in older men, and from 16% among white men to 21% among African-American men [1▪▪]. In community-dwelling men, daily urinary incontinence has been reported by 30–47% and weekly urinary incontinence by 15–37% [2]. As a result of the differences in the pathological anatomy and pathophysiology of urinary incontinence in men, there is a different distribution in incontinence subtypes. Prevalence of urgency urinary incontinence (UUI) ranges from 40 to 80%, followed by 10–30% of mixed forms of urinary incontinence, and less than 10% for stress urinary incontinence (SUI).

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Curr Opin Urol 2014, 24:553–559
DOI:10.1097/MOU.0000000000000115

KEY POINTS

- Urinary incontinence in men is a bothersome problem that impacts the quality of life.
- Conservative treatment is recommended as the first-line treatment of urinary incontinence in men.
- Evidence-based outcomes have shown the efficacy of pelvic floor muscle training in men undergoing radical prostatectomy.
- There is evolving evidence on the benefit of conservative treatment for men with other types of lower urinary tract symptoms.

The age-related increase in the prevalence of urinary incontinence observed in men is largely because of the contribution of UUI rather than SUI. The predominance of urgency type incontinence among men is not surprising as it is closely related to overactive bladder (OAB) with and without urinary incontinence. Although the prevalence of urinary incontinence in men is less than in women by a 1 : 2 ratio, the impact on the quality of life (QoL) may be higher.

As noted, male SUI is rare except after radical prostatectomy and transurethral resection of the prostate (TURP), which may cause both sphincter and local nerve injury leading to intrinsic sphincter deficiency or weakness of the urethra, with SUI as a consequence. Professional guidelines, based on the evidence-based research, have recommended conservative treatment as the first-line therapy for lower urinary tract symptoms (LUTS) of incontinence, urgency, frequency, and others because they are effective and essentially risk free [2,3▪▪,4]. Conservative behavioral treatments are a group of interventions that improve the symptoms by changing patients' behavior or environment or by teaching new skills. The purpose of this review is to determine the current evidence for conservative management of urinary incontinence in men.

BEHAVIORAL INTERVENTIONS

Behavioral treatment programs are conservative interventions that comprise multiple components which are individualized according to the patient's condition, needs, and environment. Components of a behavioral program may include patient education and any of the following: (PFMT) with or without biofeedback, active use of pelvic floor muscles (PFMs) for urethral occlusion (the 'knack'), bladder training with urge control techniques, biofeedback, electrical stimulation, voiding schedules, and lifestyle changes (fluid management, caffeine reduction, dietary changes, and weight loss). Table 1 describes these treatments. Conservative interventions can be time-intensive for both the clinician and the patient. If the patient adheres to the treatment, LUTS and the QOL improves. However, evidence-based research has mostly reported on outcomes involving adult women and only few studies involving men. The 5th International Consultation on Incontinence [3▪▪] reviewed the literature, and the evidence for conservative treatment in men is outlined in Table 2. Since that review, there have been several new studies that have reported on outcomes in men with urinary incontinence.

EVIDENCE FOR PELVIC FLOOR MUSCLE TRAINING BEFORE AND AFTER PROSTATECTOMY STRESS URINARY INCONTINENCE

Urinary incontinence is a common complication of radical prostatectomy, regardless of the technique used [5,6]. Continence rate is reported to be 10–41% after open radical prostatectomy and between 13.1 and 68.9% after robot-assisted radical prostatectomy [7]. Although continence status gradually improves in the ensuing weeks and months, evidence research has shown that PFMT can speed the recovery of continence [8▪]. PFMT consists of repeated, high-intensity contractions of the PFM. In a clinical setting, men are instructed on the identification and function of the PFM, and prescribed a home-based PFMT training program [9,10].

One approach for PFMT is to teach men how to control their PFM before prostate surgery, so they will have the opportunity to practice using their muscles in advance of needing to use them more actively following surgery. In one trial, a single session of biofeedback-assisted behavioral training reduced the duration of urinary incontinence, as well as the severity of symptoms in the 6 months following radical prostatectomy [11]. Research has also shown that PFMT immediately after radical prostatectomy, once the catheter has been removed, can return men with SUI to continence quicker [3▪▪].

Centemero [12] conducted a randomized, prospective study on men ($n = 118$) with localized prostate cancer who underwent an open radical prostatectomy. Patients were randomized to start PFM exercises preoperatively 4 weeks before surgery and continue postoperatively (group A, $n = 29$) or to only start exercising postoperatively (group B, $n = 59$). Primary outcome measure was self-reported continence, and secondary measures included 24-h pad test and health-related QoL measured

Table 1. Summary of the conservative treatments

Type of treatment	Specific intervention	Description	Expected outcomes
Behavioral therapies	Pelvic floor muscle exercises and training	Consists of muscle training and skill training (neuromuscular reeducation).	Increased PFM strength, tone, and function.
		Patient learns to identify, contract and relax the PFM, increasing the contraction magnitude and length over time.	Ability to prevent urine leakage during physical effort.
		Active use of PFMs for urethral occlusion.	Fewer incontinent episodes.
		May involve biofeedback and pelvic floor electrical stimulation.	
	Bladder training with urge suppression	Increase the time interval between voiding episodes without an incontinent episode.	Achievement of a normal voiding pattern, such as every 3–4 h.
		Use of PFM muscle and distraction techniques to lessen urgency.	Self-report that urgency less severe or less frequent.
			Increased bladder capacity.
	Voiding/toileting schedules	Fixed voiding schedules that usually involve caregiver involvement and prompting.	May prevent or produce fewer urinary incontinence episodes.
			Increase self-toileting.
Lifestyle changes	Dietary modifications	Reduce caffeine and other bladder irritants in diet.	Self-report that urinary incontinence less severe or less frequent.
		Maintain adequate oral hydration.	Voided urine volumes of three or more ounces (90 ml or more).
		Eat adequate amount of dietary fiber.	Prevent constipation.
	Bowel movement	Prevent or manage constipation and 'straining at stool'.	Regular bladder emptying without laxatives.
			Decreased nocturia and urgency
	Weight management	Avoid obesity, engage in weight loss program directed by the healthcare provider to achieve normal BMI.	Fewer incontinent episodes, especially those that occur with physical exertion.
	Smoking cessation		Fewer incontinent episodes that occur with coughing and urgency.

PFM, pelvic floor muscle.

using the International Continence Society (ICS) male short form. After 1 month, 44.1% (26 of 59) of patients were continent in group A, whereas 20.3% (12 of 59) were continent in group B ($P = 0.018$). At 3 months, 59.3% (35 of 59) and 37.3% (22 of 59) patients were continent in group A and group B, respectively ($P = 0.028$). Group A scored better on ICS male short form than group B. Trials that have combined preoperative and early postoperative training also indicate that the severity of postprostatectomy urinary incontinence can be reduced with PFMT in the short term (3 months) and in some studies up to 12 months [8▪].

Patel *et al.* [13▪] performed a retrospective analysis of men undergoing retropubic radical prostatectomy ($n = 284$) by one surgeon. The intervention group received physiotherapist-guided intensive PFMT from 4 weeks preoperatively ($n = 152$). The control group was given preoperative verbal instructions on PFM exercises ($n = 132$). This study was unique as it incorporated the use of transabdominal ultrasound for the activation, training, and timing of PFMs in different functional positions. Postoperatively, men in both groups received the intensive PFMT. At 6 weeks postoperatively, 24-h pad weight and patient-reported time to one and zero pad use was significantly lower for the

Table 2. ICI recommendation for men with urinary incontinence

Recommendation	Grade
PFMT before or after prostatectomy	
Some preoperative or immediate postoperative instruction in PFMT for men undergoing radical prostatectomy may be helpful whether this is in the form of 'hands on' therapy of verbal instruction and support remains unclear.	B
PFMT with digital rectal feedback (DRE) after radical prostatectomy	
It is not clear whether PFMT taught by digital rectal examination (DRE) offers any benefit over and above verbal or written instruction in PFMT.	B
PFMT with BF after radical prostatectomy	
The use of BF to assist PFMT is currently a therapist/patient decision based on economics and preference.	B
PFMT with or without BF with electrical stimulation after radical prostatectomy	
For men with postprostatectomy incontinence, it does not appear to be any benefit of adding EStim to a PFMT program.	B
Postoperative TURP PFMT for incontinence men	
Men can be offered instruction to do a strong PFM contraction immediately after voiding, or urethral massage to empty the urethra, to improve symptoms of postmicturition dribbling.	C
Lifestyle interventions.	
It seems reasonable for health professionals to offer men advice on healthy lifestyle choices that may reduce or delay the onset comorbid conditions that are risk factors for incontinence.	D

BF, biofeedback; PFM, pelvic floor muscle; PFMT, pelvic floor muscle training; TURP, transurethral resection of the prostate. Adapted with permission from [3▪▪].

intervention group. One of the author's conclusions was that the timing of PFM exercises, in this case preoperatively, might be an important contributing factor to its effectiveness.

The use of biofeedback for PFMT may improve a man's ability to isolate the PFM and differentiate between muscle contraction and relaxation [14]. Tienforti *et al.* [15] evaluated the efficacy of one session of intense preoperative biofeedback-assisted PFMT, combined with an assisted, low-intensity postoperative program in reducing the incidence, duration, and severity of postprostatectomy urinary incontinence and in improving the health-related QoL in men undergoing radical prostatectomy. The treatment group ($n = 16$) received a supervised biofeedback session 1 day before radical prostatectomy, a session immediately following catheter removal, and then monthly, as long as a pad was being used. The PFMT home program was a structured program that included 10 min each day of 5-s muscle contractions with 5-s muscle relaxation performed in three different positions. Exercises were recorded on a daily diary. The control group ($n = 16$) only received standard of care, oral and written instructions by the urologist on PFM exercises. All patients were followed up for a period of at least 6 months after catheter removal. Outcome assessment was performed at each monthly visit for the intervention group and at 1, 3, and 6 months after catheter removal for the control group. Self-administered questionnaires, the ICIQ-UI, ICIQ-Overactive Bladder (ICIQ-OAB), UCLA-Prostate Cancer Index (UCLA-PCI), and IPSS-QoL, were completed by men in both groups. The primary outcome measure was the self-reported recovery of continence 6 months after catheter removal. Continence was strictly defined as an ICIQ-UI score of 0. The secondary outcome measures were number of urinary incontinence episodes per week, number of pads used per week, OAB symptoms measured by the ICIQ-OAB score, urinary function measured by the UCLA-PCI score, and the impact of incontinence on the QoL measured by the IPSS-QoL score. The results for the biofeedback-assisted PFMT intervention group was positive as the number of incontinence episodes per week and the number of pads per week were significantly lower at both 3-month (3.84 vs. 14 and 1.50 vs. 6.25, respectively) and 6-month follow-up (2.72 vs. 13.06 and 1.31 vs. 4.625, respectively). Table 3 reviews the recent research of positive outcomes of PFMT in men after radical prostatectomy.

What has been evident from reviewing the current literature is that a structured and intensive PFMT treatment program delivered by an experienced clinician contributes to the effectiveness of this conservative treatment [3▪▪,19]. Some urology practices include various intensity levels of PFMT for men undergoing radical prostatectomy; however, translation from research to practice has been suboptimal as most men undergoing radical prostatectomy do not receive intensive preoperative and/or postoperative PFMT [9,10,20]. Hirschhorn *et al.* [21] identified the barriers and enablers to provision of preoperative PFMT for men undergoing radical prostatectomy. They found that a strong

Table 3. Evidence base for PFMT in men undergoing prostate cancer surgery

Study	n	Intervention	Definition of continence	Percentage continent: intervention vs. control group			
				6 Weeks	3 Months	6 Months	1 Year
Filocamo [16]	300	PFMT taught with digital anal exam in three postoperative sessions, home exercise program, bladder control strategies, the 'knack' vs. usual care	Pad test, number pads used; Dry on ICS-Male Questionnaire		23 vs. 14%	77 vs. 32%	89 vs. 68%
Burgio [11]	125	Single session of preoperative biofeedback-assisted PFMT and home exercises vs. usual care	No leakage on bladder diary		48 vs. 32%	68 vs. 48%	
Mariotti [17]	60	PFMT via biofeedback and electrical stimulation twice a week for 6 weeks postoperatively vs. usual care	≤2 g on 24-h pad test and no pad use.		80 vs. 33%	97 vs. 67%	97 vs. 97%
Ribeiro [18]	73	Biofeedback-assisted PFMT weekly and home exercises for 3 months or until continent vs. brief verbal instructions	No pad use		73 vs. 39%	88 vs. 64%	96 vs. 75%
Tienforti [15]	32	Preoperative biofeedback-assisted PFMT, monthly postoperative biofeedback-assisted PFMT vs. verbal and written instructions for home exercises	Score of 0 on the ICIQ-SF		50 vs. 6%	63 vs. 6%	
Hirschhorn [8▪]	139	Preoperative one-to-one PFMT by trained therapist or nurse to include combination of verbal instruction, printed reading material, material from internet or DVD/video vs. postoperative one-to-one PFMT by trained therapist or nurse	Improved self-report score on ICIQ-UI Short Form		6.2 vs. 9.2		
Patel [13▪]	284	Preoperative physical-therapy-guided PFMT using transabdominal ultrasound compared to a control group of preoperative verbal information on PFM exercises. Postoperatively, both groups received intensive PFMT	Pad test weight decrease; Self-reported time to one and zero pad usage	8.6 vs. 17.0 g; 25 vs. 17% (no incontinence	No difference		

PFM, pelvic floor muscle; PFMT, pelvic floor muscle training. Adapted with permission from [10].

recommendation from the urological surgeon was essential to patients' ultimate receipt of preoperative PFMT. These and other authors [10,22] have suggested that one method of improving and coordinating the patient's access to PFMT was the use of 'specialist' nurses.

CONTROLLING URGENCY

The effectiveness of behavioral training with urge suppression for men with UUI has been shown to reduce urgency, frequency, and nocturia in men [23,24▪]. The Male Overactive Bladder in Veterans (MOTIVE) study compared behavioral training with urge suppression to antimuscarinic therapy (extended-release oxybutynin) in men with OAB in the absence of bladder outlet obstruction. Mean 24-h voids decreased significantly in both groups and these reductions were statistically equivalent. This involves patient instruction in urgency suppression techniques (quick PFM contractions and distraction methods) when urgency occurs during the night. If the urge subsides, they are encouraged to go back to sleep. If after a minute or two the urge to void has not subsided, they are advised to get up and void, so as not to interfere unnecessarily with their sleep. In a study in men with nocturia [24▪], both behavioral treatment and drug therapy reduced nocturia in men with more than 1 episode of nocturia/night when added to α-blocker therapy, but the addition of behavioral treatment was statistically better than antimuscarinic therapy for nocturia.

LIFESTYLE CHANGES

Conservative measures also include changes in lifestyle that may include moderating fluid intake, avoidance of known bladder irritants such as caffeine and alcohol, weight loss, and smoking cessation. Associations between male LUTS and intake of bladder irritants and obesity have been documented. Making changes in lifestyle have been shown to improve LUTS in women, but the evidence on their effect of symptom improvement in men is sparse. The following is the most current literature on lifestyle changes and LUTS in men.

Avoidance of bladder irritants

Ingestion of caffeine has been shown to adversely affect the urinary symptoms of urgency and frequency, and its negative effect of caffeine has been shown in women [3▪▪]. More recently, evidence for this association has been increasing in men. The Boston Area Community Health (BACH) examined the longitudinal and acute associations between beverage intake and LUTS in a cohort of men and women [25]. They found men who had greater coffee intake (>2 cups/day of coffee or caffeinated tea vs. none) or total caffeine intake at baseline increased the odds of LUT storage symptoms progression. Data from the male National Health and Nutrition Examination Surveys (NHANES) indicated that caffeine consumption (equivalent to approximately two cups of coffee daily; 250 mg) was significantly associated with moderate-to-severe urinary incontinence [26].

Obesity and the effect of weight reduction

Breyer *et al.* [27▪▪] reported on the positive effect of an intensive lifestyle intervention (ILI) on the prevalence, incidence, and resolution of bothersome nocturia, increased daytime urinary voiding and urinary incontinence in overweight and obese men with type 2 diabetes. Overall, 1910 men with an average age of 59.9 years and BMI of 35.2 kg/m^2 were randomized to an ILI or diabetes support and education (DSE) group. All participants self-reported information regarding incontinence, nocturia, and daytime urinary voiding at entry and at 1 year.

The prevalence of urinary incontinence at 12 months compared with baseline decreased from 11.3 to 9.0% in the ILI group and increased from 9.7 to 11.6% in the DSE group. Those men randomized to ILI were associated with a 38% reduced odds of having urinary incontinence at 1 year relative to DSE.

CONCLUSION

Urinary incontinence and OAB symptoms of urgency, frequency, and nocturia are bothersome symptoms for men. First-line conservative treatment has no adverse effects while having the potential to be effective in improving these symptoms. Evidence-based research in men is increasing and recent publications support a strong recommendation for PFMT before and after prostatectomy. As there is an association between lifestyle choices and LUTS, all men should be counseled on the changes that can have a positive effect on the symptoms.

Acknowledgements

D.K.N. is supported by the Patient Centered Outcomes Research Institute, Veterans Administration Research and Development, Astellas Healthcare Research, and the National Institute of Health.

T.G. and D.L. are supported by the Patient Centered Outcomes Research Institute.

R.J. is supported by the Patient Centered Outcomes Research Institute, Astellas Healthcare Research.

Conflicts of interest

D.K.N. is a consultant for Uroplasty, Bard Medical.

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- ■ of special interest
- ■■ of outstanding interest

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This is the first study to document the results of a lifestyle intervention weight loss program in obese men with diabetes and urinary incontinence.