

Conservative management for postprostatectomy urinary incontinence (Review)

Anderson CA, Omar MI, Campbell SE, Hunter KF, Cody JD, Glazener CMA



**THE COCHRANE
COLLABORATION®**

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2015, Issue 1

<http://www.thecochranelibrary.com>

WILEY

TABLE OF CONTENTS

HEADER	1
ABSTRACT	1
PLAIN LANGUAGE SUMMARY	2
SUMMARY OF FINDINGS FOR THE MAIN COMPARISON	4
BACKGROUND	6
OBJECTIVES	8
METHODS	8
RESULTS	12
Figure 1.	13
Figure 2.	16
Figure 3.	17
ADDITIONAL SUMMARY OF FINDINGS	27
DISCUSSION	50
AUTHORS' CONCLUSIONS	53
ACKNOWLEDGEMENTS	53
REFERENCES	54
CHARACTERISTICS OF STUDIES	65
DATA AND ANALYSES	153
Analysis 1.1. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 1 Number of incontinent men.	164
Analysis 1.2. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 2 Number of incontinence episodes per day.	166
Analysis 1.3. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 3 Number of men using pads.	167
Analysis 1.4. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 4 Pad changes over 24 hours.	168
Analysis 1.5. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 5 Urinary Incontinence Score (ICIQ-SF).	169
Analysis 1.6. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 6 Quality of life related to urinary incontinence.	170
Analysis 1.7. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 7 Adverse events.	170
Analysis 1.8. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 8 24 hour pad test (grams of urine lost).	171
Analysis 1.9. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 9 1 hour pad test (grams of urine lost).	172
Analysis 1.10. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 10 Number of men not carrying out pelvic floor muscle contractions at 12 months.	172
Analysis 2.1. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 1 Number of incontinent men.	173
Analysis 2.2. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 2 Adverse effects.	174
Analysis 2.3. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 3 24 hour pad test (grams of urine lost).	175
Analysis 2.4. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 4 Urinary Incontinence Score (ICIQ-short form UI score).	176
Analysis 2.5. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 5 Urinary Incontinence Quality of Life Score (ICIQ-short form).	177
Analysis 2.6. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 6 Time until continent (months).	177

Analysis 4.1. Comparison 4 Treatment of UI after radical: combinations of treatments versus no treatment, Outcome 1 Number of incontinent men at < 3 months.	178
Analysis 4.2. Comparison 4 Treatment of UI after radical: combinations of treatments versus no treatment, Outcome 2 Number of incontinent men within 3-6 months.	178
Analysis 4.3. Comparison 4 Treatment of UI after radical: combinations of treatments versus no treatment, Outcome 3 Number of incontinence episodes per day at > 3 months.	179
Analysis 4.4. Comparison 4 Treatment of UI after radical: combinations of treatments versus no treatment, Outcome 4 Adverse effects.	179
Analysis 5.1. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 1 Number of incontinent men at < 3 months.	180
Analysis 5.2. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 2 Number of incontinent men within 3 to 6 months.	180
Analysis 5.3. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 3 Number of incontinent men within 6 to 12 months.	181
Analysis 5.4. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 4 Number of incontinence episodes at < 3 months.	181
Analysis 5.5. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 5 Quality of Life Score (severity of UI) within 3 to 6 months.	182
Analysis 5.6. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 6 Quality of Life Score (I-QoL) within 6-12 months.	182
Analysis 5.7. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 7 Quality of Life Score (ICI-Q-SF) within 6-12 months.	183
Analysis 5.8. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 8 Adverse events.	183
Analysis 5.9. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 9 1 hour pad test (grams of urine lost): at < 3 months.	184
Analysis 5.10. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 10 24 hour pad test (grams of urine lost): at < 3 months.	184
Analysis 5.11. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 11 24 hour pad test (grams of urine lost): within 3 to 6 months.	185
Analysis 5.12. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 12 24 hour pad test (grams of urine lost): within 3 to 6 months.	186
Analysis 5.13. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 13 Pad changes over 24 hours within 3 to 6 months.	186
Analysis 5.14. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 14 Number of men not carrying out sufficient PFMT within 3 to 6 months.	187
Analysis 6.1. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 1 Number of incontinent men.	187
Analysis 6.2. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 2 Pad changes over 24 hours.	189
Analysis 6.3. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 3 1 hour pad test (grams of urine lost).	190
Analysis 6.4. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 4 24 hour pad test (gm/24hrs).	191
Analysis 6.5. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 5 Number of incontinence episodes per day.	192
Analysis 6.6. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 6 Urinary Incontinence Score (ICI-short form).	193
Analysis 6.7. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 7 Quality of Life Score (IIQ).	194
Analysis 6.8. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 8 Pelvic floor muscle strength (anal squeeze pressure, cm H2O).	194

Analysis 6.9. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 9 Number of men not carrying out sufficient PFMT.	195
Analysis 6.10. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 10 Number of men having surgery for incontinence.	196
Analysis 7.1. Comparison 7 Prevention of UI after radical: electric or magnetic energy versus no treatment, Outcome 1 1 hour pad test (grams of urine lost).	196
Analysis 7.2. Comparison 7 Prevention of UI after radical: electric or magnetic energy versus no treatment, Outcome 2 ICIQ-SF score.	197
Analysis 9.1. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 1 Number of incontinent men within 3 to 6 months.	197
Analysis 9.2. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 2 Number of incontinent men within 6 to 12 months.	198
Analysis 9.3. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 3 24 hour pad test (grams of urine lost) within 3 to 6 months.	198
Analysis 9.4. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 4 24 hour pad test (grams of urine lost) 6 to 12 months.	199
Analysis 9.5. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 5 Time until continent (months).	199
Analysis 10.1. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 1 Number of incontinent men at < 3months.	200
Analysis 10.2. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 2 Number of incontinent men within 3 to 6 months.	201
Analysis 10.3. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 3 Number of incontinent men within 6 to 12 months.	202
Analysis 10.4. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 4 Number of incontinent men after 12 months.	203
Analysis 10.5. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 5 No. with severe incontinence (e.g. pad test weight >150g) at < 3 months.	204
Analysis 10.6. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 6 No. with severe incontinence (e.g. pad test weight >150g) at 3 to 6 months.	204
Analysis 10.7. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 7 20 minute pad test (grams of urine lost): within 3 to 6 months.	205
Analysis 10.8. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 8 20 minute pad test (grams of urine lost): within 6 to 12 months.	206
Analysis 10.9. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 9 1 hour pad test (grams of urine lost) at less than 3 months.	206
Analysis 10.10. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 10 1 hour pad test (grams of urine lost) within 3-6 months.	207
Analysis 10.11. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 11 1 hour pad test within 6-12 months.	207
Analysis 10.12. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 12 24 hour pad test (grams of urine lost) at less than 3 months.	208
Analysis 10.13. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 13 24 hour pad test (grams of urine lost) within 3-6 months.	209
Analysis 10.14. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 14 24 hour pad test (grams of urine lost) within 6-12 months.	210
Analysis 10.15. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 15 Quality of Life Score (ICS male short form) at < 3 months.	210
Analysis 10.16. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 16 Urinary Incontinence Quality of Life Score (ICIQ - short form) within 3-6 months.	211
Analysis 10.17. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 17 Urinary Incontinence Quality of Life Score (ICIQ-short form) within 6-12 months.	212

Analysis 10.18. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 18 King's health Questionnaire after 12 months.	213
Analysis 10.19. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 19 Health status measure SF-36 within 3-6 months.	214
Analysis 10.20. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 20 Adverse events.	214
Analysis 11.1. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 1 Number of incontinent men.	215
Analysis 11.2. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 2 Number of incontinence episodes per day.	216
Analysis 11.3. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 3 Number of men using pads.	217
Analysis 11.4. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 4 Urinary Incontinence Score (ICI-short form).	218
Analysis 11.5. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 5 Quality of life related to urinary incontinence.	219
Analysis 11.6. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 6 Number of men not carrying out pelvic floor muscle contractions at 12 months.	219
Analysis 16.1. Comparison 16 Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment, Outcome 1 Number of incontinent men.	220
Analysis 16.2. Comparison 16 Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment, Outcome 2 Health status measure SF-36 within 3-6 months.	221
ADDITIONAL TABLES	222
APPENDICES	231
WHAT'S NEW	243
HISTORY	243
CONTRIBUTIONS OF AUTHORS	244
DECLARATIONS OF INTEREST	245
SOURCES OF SUPPORT	245
DIFFERENCES BETWEEN PROTOCOL AND REVIEW	245
INDEX TERMS	245

[Intervention Review]

Conservative management for postprostatectomy urinary incontinence

Coral A Anderson¹, Muhammad Imran Omar^{1,2}, Susan E Campbell³, Kathleen F Hunter⁴, June D Cody⁵, Cathryn MA Glazener⁶

¹Academic Urology Unit, University of Aberdeen, Aberdeen, UK. ²London School of Hygiene and Tropical Medicine, London, UK. ³School of Health Sciences, University of East Anglia, Norwich, UK. ⁴Faculty of Nursing, University of Alberta, Edmonton, Canada. ⁵Cochrane Incontinence Review Group, University of Aberdeen, Foresterhill, UK. ⁶Health Services Research Unit, University of Aberdeen, Aberdeen, UK

Contact address: Kathleen F Hunter, Faculty of Nursing, University of Alberta, 3rd Floor Clinical Sciences Building, Edmonton, AB, T6G 2G3, Canada. kathleen.hunter@ualberta.ca.

Editorial group: Cochrane Incontinence Group.

Publication status and date: Edited (no change to conclusions), published in Issue 1, 2015.

Review content assessed as up-to-date: 5 February 2014.

Citation: Anderson CA, Omar MI, Campbell SE, Hunter KF, Cody JD, Glazener CMA. Conservative management for postprostatectomy urinary incontinence. *Cochrane Database of Systematic Reviews* 2015, Issue 1. Art. No.: CD001843. DOI: 10.1002/14651858.CD001843.pub5.

Copyright © 2015 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

ABSTRACT

Background

Urinary incontinence is common after radical prostatectomy and can also occur in some circumstances after transurethral resection of the prostate (TURP). Conservative management includes pelvic floor muscle training with or without biofeedback, electrical stimulation, extra-corporeal magnetic innervation (ExMI), compression devices (penile clamps), lifestyle changes, or a combination of methods.

Objectives

To determine the effectiveness of conservative management for urinary incontinence up to 12 months after transurethral, suprapubic, laparoscopic, radical retropubic or perineal prostatectomy, including any single conservative therapy or any combination of conservative therapies.

Search methods

We searched the Cochrane Incontinence Group Specialised Register (5 February 2014), CENTRAL (2014, Issue 1), EMBASE (January 2010 to Week 3 2014), CINAHL (January 1982 to 18 January 2014), ClinicalTrials.gov and World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (both searched 29 January 2014), and the reference lists of relevant articles.

Selection criteria

Randomised or quasi-randomised controlled trials evaluating conservative interventions for urinary continence in men after prostatectomy.

Data collection and analysis

Two or more review authors assessed the methodological quality of the trials and abstracted data. We tried to contact several authors of included studies to obtain extra information.

Main results

Fifty trials met the inclusion criteria, 45 in men after radical prostatectomy, four trials after TURP and one trial after either operation. The trials included 4717 men of whom 2736 had an active conservative intervention. There was considerable variation in the interventions, populations and outcome measures. Data were not available for many of the pre-stated outcomes. Men's symptoms improved over time irrespective of management.

There was no evidence from eight trials that pelvic floor muscle training with or without biofeedback was better than control for men who had urinary incontinence up to 12 months after radical prostatectomy; the quality of the evidence was judged to be moderate (for example 57% with urinary incontinence in the intervention group versus 62% in the control group, risk ratio (RR) for incontinence after 12 months 0.85, 95% confidence interval (CI) 0.60 to 1.22). One large multi-centre trial of one-to-one therapy showed no difference in any urinary or quality of life outcome measures and had narrow CIs. It seems unlikely that men benefit from one-to-one PFMT therapy after TURP. Individual small trials provided data to suggest that electrical stimulation, external magnetic innervation, or combinations of treatments might be beneficial but the evidence was limited.

Amongst trials of conservative treatment for all men after radical prostatectomy, aimed at both treatment and prevention, there was moderate evidence of an overall benefit from pelvic floor muscle training versus control management in terms of reduction of urinary incontinence (for example 10% with urinary incontinence after one year in the intervention groups versus 32% in the control groups, RR for urinary incontinence 0.32, 95% CI 0.20 to 0.51). However, this finding was not supported by other data from pad tests. The findings should be treated with caution because the risk of bias assessment showed methodological limitations.

Men in one trial were more satisfied with one type of external compression device, which had the lowest urine loss, compared to two others or no treatment. The effect of other conservative interventions such as lifestyle changes remained undetermined as no trials involving these interventions were identified.

Authors' conclusions

The value of the various approaches to conservative management of postprostatectomy incontinence after radical prostatectomy remains uncertain. The evidence is conflicting and therefore rigorous, adequately powered randomised controlled trials (RCTs) which abide by the principles and recommendations of the CONSORT statement are still needed to obtain a definitive answer. The trials should be robustly designed to answer specific well constructed research questions and include outcomes which are important from the patient's perspective in decision making and are also relevant to the healthcare professionals. Long-term incontinence may be managed by an external penile clamp, but there are safety problems.

PLAIN LANGUAGE SUMMARY

Conservative management for men with urinary incontinence after prostate surgery

Background information

The prostate is a male sex gland that surrounds the outlet of the bladder. Two main diseases of the prostate (cancer of the prostate, and benign (non-cancerous) prostatic enlargement) can be treated by surgery but some men suffer leakage of urine (urinary incontinence) afterwards. Conservative treatments of the leakage such as pelvic floor muscle training with or without biofeedback or anal electrical stimulation are thought to help men control this leakage.

The main findings of the review

The review of trials found that there was conflicting evidence about the benefit of therapists teaching men to contract their pelvic floor muscles for either prevention or treatment of urine leakage after radical prostate surgery for cancer. However, information from one large trial suggested that men do not benefit from seeing a therapist to receive pelvic floor muscle training after transurethral resection (TURP) for benign prostatic enlargement. Overall, there was insufficient evidence to demonstrate a beneficial effect from pelvic floor muscle training.

Of three external compression devices tested, one penile clamp seemed to be better than the others.

Adverse effects

This one penile clamp needed to be used cautiously because of safety risks.

Any limitations of the review

In future updates it may be worth considering two separate reviews, looking separately at 'treatment' and 'prevention' trials. More research that is of better quality is also needed to assess conservative management.

SUMMARY OF FINDINGS FOR THE MAIN COMPARISON *[Explanation]*

Treatment of UI after radical: PFMT ± biofeedback versus no treatment; for postprostatectomy urinary incontinence						
Patient or population: patients with postprostatectomy urinary incontinence Intervention: treatment of UI after radical: PFMT ± biofeedback versus no treatment						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Treatment of UI after radical: PFMT ± biofeedback versus no treatment				
Number of incontinent men - after 12 months	623 per 1000	529 per 1000 (374 to 760)	RR 0.85 (0.6 to 1.22)	665 (3 studies)	⊕⊕⊕○ moderate ^{1,2}	
Urinary Incontinence Score (ICI-SF) - after first year		The mean urinary incontinence score (ici-short form) - after first year in the intervention groups was 0.5 lower (1.35 lower to 0.35 higher)		391 (1 study)	⊕⊕○○ low ^{2,3,4}	
Adverse events	See comment	See comment	Not estimable	138 (1 study)	⊕⊕⊕⊕ high ^{2,3,5}	
Economic analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; RR: Risk ratio

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

¹ Wide CI (0.60 to 1.22)

² Funnel plot could not be used as there are fewer than 10 trials

³ Not applicable (only one trial)

⁴ 95% CI is very wide (-1.35 to 0.35)

⁵ Not estimable as the event rate is zero in each arm

BACKGROUND

Description of the condition

It is not uncommon for men to have urinary incontinence (UI) after prostatectomy. UI can be divided into three groups of urgency urinary incontinence (UUI), stress urinary incontinence (SUI) and mixed urinary incontinence (MUI). UUI is described by the International Continence Society (ICS) as the complaint of involuntary leakage of urine associated with a sudden desire to void urine (Altman 2013). SUI is defined as the involuntary leakage of urine with concurrent coughing, sneezing or physical exertion, whilst MUI, as the name suggests, is a mixture of the symptoms found in both of these types (Altman 2013). The reported frequency varies depending on the type of surgery and surgical technique (Grise 2001; Peyromaure 2002), the definition and quantification of incontinence (Grise 2001; Peyromaure 2002), the timing of the evaluation relative to the surgery, and who evaluates the presence or absence of incontinence (physician or patient) (Donnellan 1997; McCammon 1999). Furthermore, the costs associated with UI can be substantial. The annual cost to the National Health Service (NHS) in the UK for treating clinically significant storage symptoms in men was estimated to be GBP 303 million (Turner 2004) and the annual direct cost of UI in the US was estimated to be USD 3.8 billion (Wilson 2001).

The prevalence of UI after radical prostatectomy is widely reported, ranging from 2% to 60%, albeit at varying times after operation (Milsom 2009). For example, in one study at three months after radical prostatectomy (Donnellan 1997) 51% were subjectively wet (self-report) but 36% were wet on pad testing (objective reporting). By 12 months, 20% were subjectively still wet but only 16% were classed as wet using objective criteria.

UI is less common after transurethral resection of the prostate (TURP) for benign prostate disease (Omar 2014) and most cases are due to persistent incontinence pre-dating the surgery. Early UUI affects up to 30% to 40% of men but late SUI is rare affecting less than 0.5% of men (Rassweiler 2006). This is a less invasive operation than a radical prostatectomy and usually does not involve damage to pelvic nerves. Due to these clinical differences, we have analysed data relating to TURP separately.

After both types of operation the problem tends to improve with time, so that it declines and plateaus within one to two years postoperatively (Hunnskaar 2002). However, some men are left with incontinence that persists for years afterwards.

Continence mechanisms

Urinary continence depends on a complex interaction of smooth and striated muscle fibres blended together to form the continence mechanism. Considerable debate has existed in the literature as to whether incontinence after prostatectomy is due to an effect on the detrusor (bladder) muscle or on the sphincter, as commonly these

abnormalities coexist (Peyromaure 2002). New detrusor overactivity and intrinsic sphincter deficiency due to sphincteric injury (Ficazzola 1998; Groutz 2000; McGuire 1990) or weakness (Majoros 2006) are cited as the most important causes of persistent incontinence after radical prostatectomy. Debate continues on whether detrusor overactivity is a primary or secondary factor. Whereas some report overactivity as the primary cause of post-prostatectomy incontinence (Golubuff 1995; Leach 1995) others argue strongly that even if other factors play a role, intrinsic sphincter deficiency is the primary cause of UI after radical prostatectomy (Aboseif 1996; Chao 1995; Groutz 2000; Gudziak 1996; Kondo 2002; Majoros 2006; Winters 1997).

Risk factors for postprostatectomy UI after radical prostatectomy include pre-existing abnormalities of detrusor contractility (Leach 1995) and older age (Kondo 2002). This is possibly because in older men there is evidence of rhabdosphincter atrophy and neural degeneration (Burnett 1998; Chao 1995). Other risk factors include previous TURP (Jacobsen 2007); pre-operative radiotherapy (Kondo 2002; Rainwater 1988); trauma; a spinal cord lesion; new obstruction due to recurrence, bladder neck contracture, or urethral stricture (Litwiller 1997); Parkinson's disease (Kondo 2002); dementia; and medications (Khan 1991). A surgeon's inadequate skill and expertise can determine post-operative incontinence rates (Eastham 1996). In addition, having surgery in a hospital which performs fewer than 20 radical prostatectomies a year may be a factor (Albertsen 1997).

After TURP, UI is thought most likely to be due to pre-existing abnormalities of bladder function, such as poor compliance or detrusor overactivity, rather than direct sphincter injury (Abrams 1991), possibly because removal of the prostatic tissue removed some of the protective mechanism for continence.

Description of the intervention

Many of the treatments used in current practice for postprostatectomy UI are 'conservative', which is usually considered as not involving drugs or surgery. Treatments such as biofeedback with surface intra-anal probes are defined as non-invasive in this context, as opposed to surgical interventions. Five categories of conservative management are considered in this review, both singly and in combination when appropriate.

1. Pelvic floor muscle training (PFMT)

This involves any method of training the pelvic floor muscles to contract. It includes teaching performance of an accurate voluntary pelvic floor muscle contraction using biofeedback and coordinating and timing the contraction against increases in intra-abdominal pressure, often called functional PFMT.

Traditionally, biofeedback involves the use of equipment to provide visual or auditory feedback about the pelvic floor muscle function to enable one to train, strengthen and increase endurance and

co-ordination of the pelvic floor muscle contractions. Simple auditory biofeedback can also be provided by the therapist informing the patient when a contraction is felt through digital anal examination during the pelvic floor muscle contraction. Additionally, pelvic floor muscle contraction electromyography (EMG) can be used as a surrogate for biofeedback, as well as for measuring the intra-rectal pressure.

The theoretical basis of PFMT is that repeated, volitional contractions of selected pelvic floor muscles may improve their strength and efficiency during periods of increased intra-abdominal pressure and can inhibit detrusor activity. In a systematic review of the literature on female UI, Berghmans and colleagues noted that a pelvic floor muscle contraction may raise the urethra and press it towards the symphysis pubis, prevent urethral descent, and improve structural support of the pelvic organs (Berghmans 1998). They further pointed out that PFMT may result in hypertrophy of the peri-urethral striated muscles thereby increasing the 'external mechanical pressure' on the urethra.

2. Electrical stimulation (non-invasive) delivered via surface electrodes

Electrical stimulation (ES) works by activating the motor fibres of the pudendal nerve, which can result in contraction of the pelvic floor muscles or the striated peri-urethral musculature, supporting the intrinsic part of the urethral sphincter closing mechanism (Berghmans 2013). This may be important in the management of men with SUI by stimulating the intrinsic sphincter, strengthening the pelvic muscles and raising the patient's awareness of these muscles in a similar way to biofeedback. ES can also be helpful in men with detrusor overactivity or UUI because it can stimulate afferent fibres of the pudendal nerve, decreasing the sensation of urgency and inhibiting parasympathetic activity which results in a decrease in involuntary detrusor contractions (Berghmans 2013). Two types of non-invasive ES are detailed below. The parameters of the ES used in studies vary depending on the type of UI and ES. Parameters include pulse width and duration, current intensity, stimulus frequency, current source, pulse shape, duration of treatment and total number of sessions, and rest to work ratio.

Anal electrical stimulation (ES)

Any type of ES using a non-invasive surface anal probe designed for the therapy. The intention of ES is to facilitate contraction of the peri-urethral striated muscle by inserting the probe into the anal canal (Jabs 2001).

Sticky patch electrodes, also called transcutaneous electrical nerve stimulation (TENS)

TENS is a low intensity, sensory nerve stimulation used for detrusor overactivity. It is delivered at various sites using patch electrodes. Sites include the sacral dermatomes, dorsal penile nerve,

hamstring and quadriceps muscle, and the posterior tibial or perineal nerves (Berghmans 2013).

3. Lifestyle adjustment

This includes fluid adjustment, healthy diet, avoiding excessive caffeine, physical exercise, weight loss and cessation of smoking.

4. Extra-corporeal magnetic innervation

This involves the use of a magnetic chair to stimulate contraction of the pelvic floor muscles and sacral nerve roots, without the discomfort of inserting an anal probe (Galloway 2000).

5. External penile compression devices (penile clamps)

These devices use an external clamp to achieve non-surgical compression of the urethra.

Timing of the intervention

Conservative treatment can be started before or after surgery. In general, when it is delivered to all men (whether before or after) the aim is to prevent the development or persistence of UI. We have therefore distinguished between treatment of all men who do have UI (treatment) as opposed to a mixed population of men some of whom do not have UI (prevention).

How the intervention might work

All of these interventions, apart from lifestyle adjustment and a penile clamp, work by inducing contraction of pelvic muscles to increase their strength and efficiency, whilst improving co-ordination and bladder control by inhibiting overactive detrusor activity. Repetitive contractions can raise urethral closure pressure at rest and during an increase in intra-abdominal pressure.

Why it is important to do this review

The uncertainty about the benefit of conservative treatment for men with UI after prostate surgery was confirmed in the initial Cochrane review, first published in 1999 (Moore 1999b) and updated in 2001 (Moore 2001). The review originally only considered post-operative PFMT, biofeedback and electrical stimulation. In a subsequent update (Hunter 2004) the review was broadened to include trials evaluating lifestyle adjustment, external penile compression devices and extracorporeal magnetic innervation. The most recent update also included trials on men after TURP (Hunter 2007) but still did not provide reliable evidence on the effects of conservative treatment. The current update includes 13 new trials.

OBJECTIVES

To determine the effectiveness of conservative management for urinary incontinence (UI) up to 12 months after transurethral or radical retropubic prostatectomy, including any single conservative therapy or any combination of conservative therapies.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials and quasi-randomised trials of conservative management to prevent or treat UI after TURP or radical prostatectomy were included. Trials were included if they used any single conservative therapy or any combination of conservative therapies. Other forms of clinical trials were excluded. Analysis of trials in men having radical prostatectomy was done separately from those in men having a TURP.

Types of participants

Adult men with UI following prostatectomy.

Types of interventions

PFMT; biofeedback (verbal or machine-mediated); electrical stimulation (ES) via a surface electrode (e.g. anal probe ES, sticky patch electrode, transcutaneous electrical nerve stimulation (TENS)); extra-corporeal magnetic innervation (ExMI); lifestyle adjustment; and external penile compression devices. These interventions could be compared with no treatment or with each other, alone or in combination.

The following comparisons were made for treatment or prevention of UI after prostatectomy.

Radical prostatectomy

Treatment (of men with UI after radical prostatectomy)

- (1) Treatment of UI after radical prostatectomy: PFMT plus or minus biofeedback versus no treatment or sham therapy or verbal instruction
- (2) Treatment of UI after radical prostatectomy: electric or magnetic energy (e.g. anal ES (EStim), perineal ES, transcutaneous electrical nerve stimulation (TENS), extra-corporeal magnetic innervation (ExMI)) versus no treatment or sham treatment
- (3) Treatment of UI after radical prostatectomy: lifestyle interventions versus no treatment or sham treatment

- (4) Treatment of UI after radical prostatectomy: combinations of treatments versus no treatment or sham treatment
- (5) Treatment of UI after radical prostatectomy: one treatment versus another active treatment

Prevention (of UI in men after radical prostatectomy)

- (6) Prevention of UI after radical prostatectomy: PFMT plus or minus biofeedback versus no treatment or sham therapy or verbal instruction
- (7) Prevention of UI after radical prostatectomy: electric or magnetic energy (e.g. anal ES (EStim), perineal ES, TENS, extra-corporeal magnetic innervation (ExMI)) versus no treatment or sham treatment
- (8) Prevention of UI after radical prostatectomy: lifestyle interventions versus no treatment or sham treatment
- (9) Prevention of UI after radical prostatectomy: combinations of treatments versus no treatment or sham treatment
- (10) Prevention of UI after radical prostatectomy: one treatment versus another active treatment

TURP

Treatment (of men with UI after TURP)

- (11) Treatment of UI after TURP: PFMT plus or minus biofeedback versus no treatment or sham therapy or verbal instruction
- (12) Treatment of UI after TURP: electric or magnetic energy (e.g. anal ES (EStim), perineal ES, TENS, extra-corporeal magnetic innervation (ExMI)) versus no treatment or sham treatment
- (13) Treatment of UI after TURP: lifestyle interventions versus no treatment or sham treatment
- (14) Treatment of UI after TURP: combinations of treatments versus no treatment or sham treatment
- (15) Treatment of UI after TURP: one treatment versus another active treatment

Prevention (of UI in men after TURP)

- (16) Prevention of UI after TURP: pre or post-operative PFMT plus or minus biofeedback versus no treatment or sham therapy or verbal instruction
- (17) Prevention of UI after TURP: electric or magnetic energy (e.g. anal ES (EStim), perineal ES, TENS, extra-corporeal magnetic innervation (ExMI)) versus no treatment or sham treatment
- (18) Prevention of UI after TURP: lifestyle interventions versus no treatment or sham treatment
- (19) Prevention of UI after TURP: combinations of treatments versus no treatment or sham treatment
- (20) Prevention of UI after TURP: one treatment versus another active treatment

Containment of urinary incontinence (UI) from any cause

(21) External penile compression devices (penile clamps) versus no treatment or sham treatment

We have not listed all possible comparisons here. As and when new trials address new comparisons these will be added to the review. Pharmacological agents will be considered in separate reviews. Verbal or written instructions, as well as sham therapy, were considered as 'no treatment'. The use of the term 'sham therapy' in this review meant any therapy that could not influence the pelvic floor muscles such as placing an ES probe in the anus but not turning it on.

Types of outcome measures

Primary outcomes

- Number of men reporting urinary incontinence (UI) after 12 months
- Quality of life assessed using the International Consultation on Incontinence Questionnaire Urinary Incontinence Short Form (ICIQ-UI-SF) or (ICIQ-SF)
- Number of men reporting adverse effects

Secondary outcomes

1. Participant reported observations

- Number of men reporting UI (number not cured, in the short, medium or long term)
- Number of men with no improvement in UI (number not cured or improved)
- Self-report of satisfaction with method
- Compliance

2. Quantification of symptoms

- Standardised pad test (24 hour or 1 hour) measuring grams of urine lost
- Frequency of micturitions per 24 hours
- Number of pad or clothing changes (pad changes per 24 hours)
- Frequency of UI from self-report or diary (incontinent episodes per 24 hours)

3. Clinician reported urinary outcome measures

- Objective or observed leakage
- Urodynamic outcome measures

4. Quality of life

- Impact of UI e.g. Incontinence Impact Questionnaire (Uebersax 1995)
- General health status e.g. Short Form 36 (Ware 1993)

5. Adverse effects

- Pain or discomfort
- Other adverse outcomes as reported by individual trials and judged to be important

6. Health economics outcomes

- Cost of intervention
- Resource implications of differences in outcome
- Cost effective analysis

7. Other outcomes

- Non-prespecified outcomes judged important when performing the review

The quality of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (Guyatt 2011a; Guyatt 2011b; Guyatt 2013; Guyatt 2013a). This approach divides the quality of evidence into four categories: high, moderate, low and very low. Randomised controlled trials (RCTs) start as high quality evidence and non-randomised trials begin as low quality evidence. The quality of evidence can be rated down for RCTs and up or down for non-RCTs depending on predefined characteristics. The factors considered when assessing the quality of evidence included:

1. limitations in study design and implementation;
2. indirectness of evidence;
3. unexplained heterogeneity or inconsistency of results;
4. imprecision of results;
5. high probability of publication bias.

Primary and secondary outcomes were classified as critical, important or not important for decision making from the man's perspective. The GRADE working group strongly advises a maximum of seven outcomes in a systematic review (Guyatt 2011a). The critical outcomes for assessing quality of evidence included in this review were:

1. number of men reporting UI after 12 months;
2. quality of life assessed using the ICIQ-UI-SF;
3. number of men reporting adverse effects;
4. cost effective analysis.

Search methods for identification of studies

We did not impose any language or other limits on the searches. Details of the search methods used for the previous versions of this review can be found in [Appendix 1](#) and [Appendix 2](#).

Electronic searches

This review has drawn on the search strategy developed for the Incontinence Review Group. Relevant trials were identified from the Incontinence Review Group Specialised Register of controlled trials which is described, along with the Group's search strategy, in the Incontinence Group's [module](#) in *The Cochrane Library*. The register contains trials identified from the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, MEDLINE In-Process, and handsearching of journals and conference proceedings. The Incontinence Group Specialised Register was searched using the Group's own keyword system; the search terms used were:

```
{design.cct*} OR {design.rct*}
```

AND

```
{topic.urine.incon.postprost*}
```

(All searches were of the keyword field of [Reference Manager 2012](#)).

The date of the most recent search of the Specialised Register for this review was 5 February 2014. Most of the trials in the Incontinence Group Specialised Register are also contained in CENTRAL.

Specific searches were also performed for this update of the review.

- CENTRAL (OvidSP) (2014, Issue 1) was searched on 26 February 2014.
- EMBASE (OvidSP) (January 2010 to Week 3 2014) was searched on 20 January 2014.
- CINAHL (EBSCOhost) (January 1982 to 18 January 2014) was searched on 22 January 2014.
- ClinicalTrials.gov (via the Cochrane Register of Studies (CRS) interface) and World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (both searched on 29 January 2014).

The strategies used to search these databases can be found in [Appendix 3](#).

Searching other resources

Reference lists of relevant articles

The reference lists of relevant articles were searched for other possibly relevant trials.

Contact with investigators in the field

We contacted investigators to ask for other possibly relevant trials, published or unpublished.

Data collection and analysis

Comparisons of the outcomes of the chosen interventions with no treatment, with each other, and in combination were planned a

priori for the review update. Data were not available for all planned comparisons. There was considerable diversity in the length of time interventions were carried out for and in the timing of outcome measurements relative to randomisation. The data were therefore reported at three monthly time points.

Selection of studies

The list of abstracts for each update was reviewed independently by two review authors and results compared. The full text articles of references or abstracts identified as potentially relevant by either review author were retrieved and reviewed by both. Reference lists of relevant review articles were reviewed to identify any further trials. References were assessed based on the population, interventions, control management, outcomes and overall study design. Using the full texts of the potentially relevant published studies and abstracts, the same two review authors independently reviewed the studies for relevance and inclusion. Authors were contacted for further data or clarification of methods. Disagreements were resolved through discussion; third party arbitration was not required.

Attempts were made to contact authors of trial reports if clarification was necessary. Studies were excluded from the review if they made comparisons other than those pre-specified or if data were unavailable. Excluded studies were listed with reasons for their exclusion.

Data extraction and management

Data for the trials were extracted independently by two review authors using a standard form developed for this purpose. The following information was included:

- study method and characteristics (design, method of randomisation, inclusion and exclusion criteria, withdrawals and dropouts);
- participants (type of surgery, age, timing of randomisation, baseline incontinence or not);
- type of intervention, timing (before or after surgery, or both) and duration of therapy, co-interventions;
- control (no treatment or sham therapy or other active treatment);
- outcomes (types of outcome measures, reported outcomes, adverse events).

Extracted data were compared by two review authors for completeness and accuracy, and cross-checked by another review author if necessary. Disagreements were resolved through discussion and review of the trial report. New data were entered using RevMan5 software.

Assessment of risk of bias in included studies

The risk of bias of the trials was assessed using the Cochrane 'risk of bias' tool.

The following methodological parameters were recorded:

- 1) identification of study as randomised or quasi-randomised;
- 2) description of inclusion and exclusion criteria;
- 3) potential for selection bias (method of sequence generation, adequacy of random allocation concealment) rating;
- 4) potential for bias around the time of treatment or during outcome assessment (blinding of participants, personnel, outcome assessors);
- 5) potential for selection bias in the analysis (description of withdrawals, dropouts, participants lost to follow up, analysis based on intention to treat).

Measures of treatment effect

Analyses were based on available data from all included trials that were relevant to the comparisons and outcomes of interest. Meta-analysis was undertaken where data were available from more than one study assessing the same outcome. A fixed-effect model was used for calculations of pooled estimates and their 95% confidence intervals (CIs), or a random-effects model if there was heterogeneity. For categorical outcomes we related the numbers reporting an outcome to the numbers at risk in each group to calculate a risk ratio (RR) with 95% CI. For continuous variables we used means and standard deviations to calculate a mean difference (MD) with 95% CI. If similar outcomes were reported on different scales, we calculated the standardised mean difference (SMD). We reversed the direction of effect if needed to ensure consistency across trials. If data to calculate RRs or MDs were not given, we utilised the most detailed numerical data available to calculate the actual numbers or means and standard deviations (for example test statistics, P values).

Unit of analysis issues

The primary analysis was per man randomised.

Dealing with missing data

Analysis of the data was on an intention-to-treat basis to the furthest possible extent. This meant all participants were analysed in the groups to which they were randomised. If this was not the case, we considered whether to exclude the trial. Attempts were made to obtain missing data from the original trialists. However, if this was not possible data were reported as given in the studies, except if there was evidence of differential loss to follow up from the randomised groups. In that case, the use of imputation of missing data was considered. If trials reported sufficient detail to calculate MDs but gave no information on the associated standard deviation (SD), the outcome was assumed to have a SD equal to the highest SD from other trials within the same analysis.

Assessment of heterogeneity

Trials were only combined if they were thought to be clinically similar. We assessed heterogeneity between studies by visual inspection of plots of the data, the Chi² test for heterogeneity and I² statistic (Higgins 2011). We used the thresholds for interpretation of the I² statistic in accordance with the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2003).

Assessment of reporting biases

Due to the difficulty of detecting and correcting for publication bias and other reporting biases, the authors aimed to minimise their potential impact by ensuring a comprehensive search for eligible studies and by being careful to watch for duplication of data. Funnel plots could not be utilised because there were fewer than 10 trials in each meta-analysis.

Data synthesis

Included trial data were processed as described in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011). For dichotomous outcomes, data were summarised (for example number of people for whom an outcome is present or not) and risk ratios (RR) calculated with their 95% CIs. For continuous outcomes, each trial was summarised using the mean value for each group and SD, and combined as mean difference (MD) if the same scale (for example pad test in grams of urine) was used for the outcome measurement in more than one trial. A fixed-effect model was used to calculate the summary statistic and the 95% CI. Heterogeneity was assessed visually and using the Chi² test for heterogeneity and the I² statistic (Higgins 2003). Forest plots were examined and potential sources influencing heterogeneity identified. Possible sources of heterogeneity were explored statistically through subgroup analysis. Where synthesis was deemed not appropriate, a narrative overview was planned. Trials were combined if interventions were based on similar clinical criteria. To combine trial data, a meta-analysis was conducted and a fixed-effect model approach to the analysis was utilised unless there was evidence of heterogeneity across studies, in which case a random-effects model was used.

Subgroup analysis and investigation of heterogeneity

We planned to perform subgroup analysis based on cancer stage but there were not enough data.

Sensitivity analysis

We planned to perform sensitivity analysis to investigate the effect of including or excluding trials at high risk of bias, however not enough trials were in the meta-analysis.

RESULTS

Description of studies

Results of the search

For the current update (2014) of the review 764 possibly relevant articles and abstracts were identified. Sources and numbers of potentially eligible titles were:

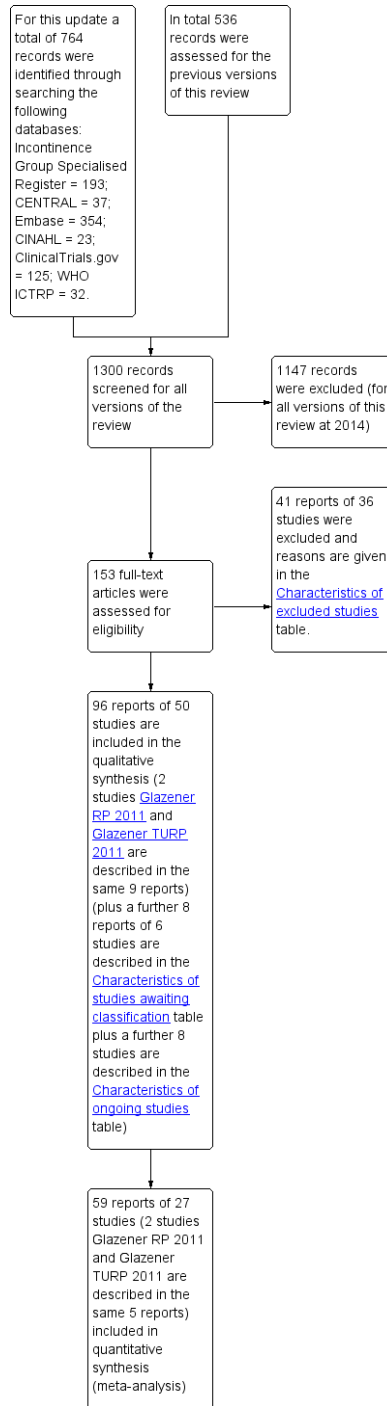
- Incontinence Review Group Specialised Register (193);
- CENTRAL (37);
- updated search of EMBASE (354);

- CINAHL (23);
- ClinicalTrials.gov (125);
- WHO ICTRP (32).

Overall 96 reports of 50 studies were included in the qualitative synthesis. Fifty-nine reports of 27 studies were included in the quantitative synthesis. Four trials are awaiting further information from the authors ([Crivellaro 2011](#); [Delmastro 2010](#); [Lilli 2006 NEW](#); [Zhang 2007](#)) and eight trials are ongoing ([Burnett 2012](#); [Burnett 2013](#); [Fode 2012 NEW](#); [Goode 2014](#); [Mina 2013](#); [Ng 2011](#); [Terrone 2007](#); [Zopf 2012](#)).

Forty-one reports of 36 studies were excluded and reasons are given in the 'Characteristics of excluded studies' table. The flow of the literature through the assessment process is shown in the PRISMA study flow chart ([Figure 1](#)).

Figure 1. PRISMA study flow diagram.



New included trials

After abstract and full text screening 13 relevant new trials (Ahmed 2012; Dijkstra-Eshuis 2013; Fader 2013; Fode 2014; Geraerts 2013; Ghanem 2013; Hou 2013; Laurienzo 2013; Marchiori 2010; Martini 2011; Morihiro 2011; Park 2012; Tienforti 2012) were identified. We also identified 12 new reports of the trials which were already identified in the previous update (Campbell 2012). The trialists were contacted for additional information and data.

One previously included trial published as an abstract was updated with data from a full publication (Centemero 2009).

Included studies

Types of populations

The trials included 4717 men, of whom 2736 had an active conservative intervention.

Surgery

Forty-five trials involved patients undergoing radical prostatectomy (Ahmed 2012; Bales 2000; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Dubbelman 2004; Fader 2013; Filocamo 2005; Floratos 2002; Fode 2014; Franke 1998; Geraerts 2013; Ghanem 2013; Glazener RP 2011; Goode 2009; Hoffman 2005; Koo 2009; Laurienzo 2013; Liu 2008; Manassero 2007; Marchiori 2010; Mariotti 2009; Martini 2011; Mathewson-Chapman 97; Moore 1999; Moore 2004; Moore 2008; Morihiro 2011; Nowak 2007; Opsomer 1994; Overgard 2008; Park 2012; Parekh 2003; Perissinotto 2008; Ribeiro 2008; Robinson 2008; Robinson 2009; Seleme 2008; Tienforti 2012; Tobia 2008; van Kampen 1998; Wille 2003; Yamanishi 2006; Yokoyama 2004; Zhang 2007).

One very small trial included one patient having a TURP while the rest were radical prostatectomy patients (Joseph 2000) but this was included in the radical prostatectomy group for analysis. Also, as all the men in this trial were incontinent for some time after surgery, they may have represented a group with persistent (longer than one to two years) UI. There were many potentially confounding variables in this trial, acknowledged by the author. Four trials involved patients after TURP (Glazener TURP 2011; Hou 2013; Porru 2001; Tibaek 2007).

The trials involving post-TURP patients only (Glazener TURP 2011; Hou 2013; Porru 2001; Tibaek 2007) were analysed separately from the trials amongst men having radical prostatectomy.

Continence status of populations

There was variation in continence status, which led to different populations being studied separately: those with persistent UI and those with all men undergoing surgery (many of whom were likely to recover continence spontaneously). The comparisons were therefore structured to reflect this: trials which included only men with post-operative incontinence were deemed to be trials of treatment, while trials in which all men were treated (irrespective of continence status) were deemed to be trials of prevention.

- Twenty-three treatment trials enrolled only men with post-operative UI (diagnosis of UI varied with recruitment time) (Dubbelman 2004; Fader 2013; Floratos 2002; Franke 1998; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Hoffman 2005; Joseph 2000; Koo 2009; Liu 2008; Manassero 2007; Marchiori 2010; Moore 1999; Moore 2004; Moore 2008; Opsomer 1994; Robinson 2009; Seleme 2008; van Kampen 1998; Yamanishi 2006; Yokoyama 2004; Zhang 2007).
- Twenty-seven prevention trials included all men who underwent surgery, some of whom may have been dry or become dry spontaneously (Ahmed 2012; Bales 2000; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Filocamo 2005; Fode 2014; Geraerts 2013; Ghanem 2013; Hou 2013; Laurienzo 2013; Mariotti 2009; Martini 2011; Mathewson-Chapman 97; Morihiro 2011; Nowak 2007; Overgard 2008; Park 2012; Parekh 2003; Perissinotto 2008; Porru 2001; Ribeiro 2008; Robinson 2008; Tibaek 2007; Tienforti 2012; Tobia 2008; Wille 2003).

Timing of recruitment

As the populations and the type and timing of interventions varied so greatly among the trials, the decision was made by the authors to also identify the timing of the recruitment to the trials and the timing of the intervention (before or after surgery):

- only post-operative treatment for UI (Ahmed 2012; Dubbelman 2004; Floratos 2002; Franke 1998; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Hoffman 2005; Hou 2013; Joseph 2000; Koo 2009; Liu 2008; Manassero 2007; Marchiori 2010; Mariotti 2009; Moore 1999; Moore 2008; Morihiro 2011; Nowak 2007; Overgard 2008; Park 2012; Ribeiro 2008; Robinson 2009; Seleme 2008; van Kampen 1998; Yokoyama 2004; Zhang 2007) or containment (Fader 2013; Moore 2004); and
- pre-operative recruitment of all men undergoing surgery, which included a pre-operative intervention with or without a post-operative intervention (Bales 2000; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Filocamo 2005; Fode 2014; Geraerts 2013; Ghanem 2013; Laurienzo 2013; Martini 2011; Mathewson-Chapman 97; Parekh 2003; Perissinotto

2008; Porru 2001; Robinson 2008; Tibaek 2007; Tienforti 2012; Tobia 2008; Wille 2003; Yamanishi 2006).

Time of recruitment of participants to the trial relative to the time of their surgery also varied:

- pre-operatively (Ahmed 2012; Bales 2000; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Fode 2014; Geraerts 2013; Ghanem 2013; Hou 2013; Laurienzo 2013; Martini 2011; Mathewson-Chapman 97; Moore 2008; Nowak 2007; Overgard 2008; Parekh 2003; Perissinotto 2008; Robinson 2008; Tibaek 2007; Tienforti 2012; Tobia 2008; Wille 2003);
- within days or up to two weeks post-operatively or after catheter removal (Dubbelman 2004; Filocamo 2005; Floratos 2002; Franke 1998; Glazener RP 2011; Glazener TURP 2011; Hoffman 2005; Koo 2009; Liu 2008; Manassero 2007; Marchiori 2010; Mariotti 2009; Park 2012; Porru 2001; Ribeiro 2008; Robinson 2009; van Kampen 1998; Yamanishi 2006);
- weeks to months after surgery (Goode 2009; Joseph 2000; Moore 1999; Moore 2004; Opsomer 1994; Seleme 2008; Zhang 2007).

Types of interventions

In the included trials, there was considerable variation in the type and intensity of interventions. Table 1 gives the exact details of the interventions used in each trial. The duration of the treatment varied from four weeks up to one year. The interventions included:

- PFMT alone (Centemero 2009; Dubbelman 2004; Filocamo 2005; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Laurienzo 2013; Martini 2011; Park 2012; Perissinotto 2008; Porru 2001; Tobia 2008);
- PFMT plus biofeedback (Bales 2000; Burgio 2006; Dijkstra-Eshuis 2013; Floratos 2002; Franke 1998; Geraerts 2013; Hou 2013; Joseph 2000; Manassero 2007; Marchiori 2010; Mathewson-Chapman 97; Moore 1999; Moore 2008; Overgard 2008; Parekh 2003; Ribeiro 2008; Robinson 2008; Robinson 2009; Tibaek 2007; Tienforti 2012);
- ES with PFMT (Ahmed 2012; Hoffman 2005; Laurienzo 2013; Morihito 2011; Wille 2003; Yamanishi 2006);
- ES with PFMT and biofeedback (Ahmed 2012; Goode 2009; Mariotti 2009; Opsomer 1994; Seleme 2008; Wille 2003; Zhang 2007);
- extra-corporeal magnetic innervation (ExMI) with PFMT (Koo 2009; Liu 2008; Nowak 2007);
- extra-corporeal magnetic innervation (ExMI) with PFMT or ES with PFMT (Yokoyama 2004);
- penile compression (Fader 2013; Moore 2004);
- transcutaneous mechanical nerve stimulation by vibration with PFMT (Fode 2014).

No trials testing lifestyle changes alone were identified.

Types of comparators

There was considerable variation in the types of comparators. Table 1 provides the details of the comparators used in each trial. The comparators included:

- no treatment, verbal or written instructions or sham therapy (Ahmed 2012; Bales 2000; Burgio 2006; Centemero 2009; Dubbelman 2004; Filocamo 2005; Franke 1998; Glazener RP 2011; Glazener TURP 2011; Hou 2013; Laurienzo 2013; Liu 2008; Manassero 2007; Marchiori 2010; Mariotti 2009; Martini 2011; Mathewson-Chapman 97; Moore 2004; Moore 2008; Morihito 2011; Nowak 2007; Opsomer 1994; Overgard 2008; Park 2012; Parekh 2003; Perissinotto 2008; Porru 2001; Ribeiro 2008; Robinson 2008; Robinson 2009; Tibaek 2007; Tienforti 2012; Tobia 2008; van Kampen 1998; Wille 2003; Yamanishi 2006; Yokoyama 2004);
- active treatment (Ahmed 2012; Dijkstra-Eshuis 2013; Floratos 2002; Fode 2014; Geraerts 2013; Ghanem 2013; Goode 2009; Hoffman 2005; Joseph 2000; Koo 2009; Laurienzo 2013; Moore 1999; Seleme 2008; Zhang 2007).

Types of outcome measures

There was a lack of consistency in the reporting of outcome measures. In terms of the primary outcomes of interest in this review these included:

- number of men with incontinence, for radical surgery (Ahmed 2012; Bales 2000; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Dubbelman 2004; Filocamo 2005; Floratos 2002; Fode 2014; Franke 1998; Geraerts 2013; Ghanem 2013; Glazener RP 2011; Goode 2009; Manassero 2007; Marchiori 2010; Mariotti 2009; Mathewson-Chapman 97; Moore 1999; Moore 2004; Morihito 2011; Opsomer 1994; Overgard 2008; Parekh 2003; Park 2012; Tobia 2008; van Kampen 1998; Yamanishi 2006) and for TURP (Glazener TURP 2011; Porru 2001; Tibaek 2007; Tienforti 2012);
- number not cured (Zhang 2007) (assumed to indicate number of incontinent men);
- time until continent (Fode 2014; Marchiori 2010; Mariotti 2009);
- number of pad changes over 24 hours (Floratos 2002; Koo 2009; Mathewson-Chapman 97; Ribeiro 2008; Tienforti 2012);
- number of men using pads (Glazener RP 2011; Glazener TURP 2011);
- number of incontinence episodes per day (Glazener RP 2011; Glazener TURP 2011; Goode 2009; Tienforti 2012);
- pad test weights, grams of urine lost in 24 hours (Ahmed 2012; Geraerts 2013; Joseph 2000; Koo 2009; Mariotti 2009; Mathewson-Chapman 97; Moore 1999; Moore 2008; Overgard 2008; Park 2012; Ribeiro 2008; Yamanishi 2006), 1 hour (Floratos 2002; Geraerts 2013; Hoffman 2005), 20 minutes (Wille 2003);

- number with severe incontinence (pad test weight > 150 g) (Centemero 2009);
- quality of life (condition-specific such as incontinence scores): ICIQ-SF score (Centemero 2009; Glazener RP 2011; Glazener TURP 2011; Park 2012; Ribeiro 2008; Yamanishi 2006), severity of UI (Zhang 2007), I-QoL (Seleme 2008), ICI-Q-SF (Liu 2008), IIQ (Ahmed 2012; Ribeiro 2008), ICIQ-SF QoL score (Glazener RP 2011; Glazener TURP 2011; Yamanishi 2006), EPIC-UI (Goode 2009), KHQ (Dijkstra-Eshuis 2013);
- pelvic floor muscle strength (Overgard 2008);
- carrying out PFMT or compliance (Glazener RP 2011; Glazener TURP 2011; Goode 2009; Overgard 2008; Zhang 2007).

Excluded studies

In total 36 studies were excluded. The majority of the studies that

did not meet the inclusion criteria were excluded because the study design was not appropriate or the intervention was not relevant for the population of interest. See the [Excluded studies](#) table for a more detailed description.

Risk of bias in included studies

The assessment criteria of The Cochrane Collaboration assume that the avoidance of bias is best achieved by: a randomised trial with an adequate method of random sequence generation; secure concealment of allocation prior to formal entry; adequate blinding of patients, healthcare providers and outcome assessors; description of reasons and numbers of withdrawals and dropouts; and analysis on an intention-to-treat basis. None of the early trials fulfilled all these criteria. However recent trials have fared much better in terms of secure concealment of allocation and blinding but overall this continues to be problematic in many trials (Figure 2; Figure 3).

Figure 2. Methodological quality graph: review authors' judgements about each methodological quality item presented as percentages across all included studies.

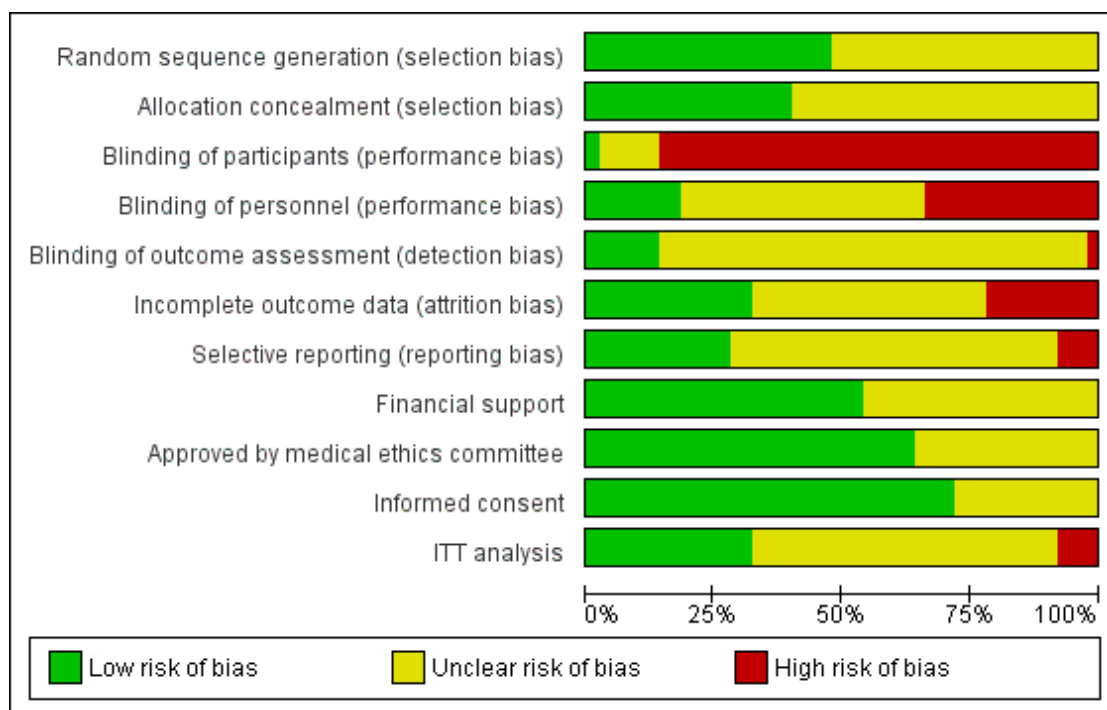


Figure 3. Methodological quality summary: review authors' judgements about each methodological quality item for each included study.

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants (performance bias)	Blinding of personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Financial support	Approved by medical ethics committee	Informed consent	ITT analysis
Ahmed 2012	●	●	●	●	●	●	●	●	●	●	●
Bales 2000	?	?	●	●	?	?	?	?	?	?	?
Burgio 2006	●	●	●	●	?	?	●	●	●	●	?
Centemero 2009	●	●	●	?	?	?	●	●	●	●	●
Dijkstra-Ethuis 2013	●	?	●	●	●	●	●	●	●	●	●
Dubbelman 2004	●	●	●	?	?	●	?	?	●	●	?
Fader 2013	?	?	●	?	?	?	●	●	●	●	?
Filocamo 2005	●	?	●	●	?	?	?	?	●	●	?
Floratos 2002	?	?	●	●	●	●	?	?	?	●	?
Fode 2014	●	●	●	?	●	●	●	●	●	●	●
Franke 1998	?	?	?	?	?	?	?	?	?	?	?
Geraets 2013	?	●	●	●	●	●	●	●	●	●	●
Ghanem 2013	?	?	●	?	?	?	?	●	●	●	?
Glazener RP 2011	●	●	●	?	●	●	●	●	●	●	●
Glazener TURP 2011	●	●	●	?	●	●	●	●	●	●	●
Goode 2009	●	●	●	?	?	●	●	●	●	●	?
Hoffman 2005	?	?	?	?	?	●	?	?	?	?	●
Hou 2013	?	?	●	?	?	?	?	?	?	?	?
Joseph 2000	?	?	●	●	?	?	?	?	?	?	●
Koo 2009	?	?	?	?	?	?	?	?	?	?	?
Laurenzo 2013	?	?	●	?	?	?	●	●	●	●	●
Liu 2008	?	?	●	?	?	?	?	?	?	?	?
Manassero 2007	●	●	●	?	●	?	?	?	●	●	●
Marchionni 2010	?	?	●	●	●	●	?	?	?	?	?
Mariotti 2009	?	?	●	?	?	?	?	?	?	?	?
Martini 2011	?	?	●	?	?	?	?	?	?	?	?
Mathewson-Chapman 97	●	●	●	?	?	?	?	?	?	?	?
Moore 1999	●	●	●	?	●	?	?	?	?	?	●
Moore 2004	●	●	●	?	●	?	?	?	?	?	?
Moore 2008	●	●	●	?	?	?	?	?	?	?	?
Morihito 2011	?	?	●	?	?	?	?	?	?	?	?
Nowak 2007	?	?	●	?	?	?	?	?	?	?	?
Opsomer 1994	?	?	?	?	?	?	?	?	?	?	?
Overgard 2008	●	●	●	●	●	●	●	●	●	●	●
Parekh 2003	?	?	●	?	?	?	?	?	?	?	?
Park 2012	●	●	●	●	●	●	●	●	●	●	●
Perissinotto 2008	?	?	?	?	?	?	?	?	?	?	?
Potru 2001	?	?	●	?	?	?	?	?	?	?	?
Ribeiro 2008	?	?	●	?	?	?	?	?	?	?	?
Robinson 2008	●	●	●	?	?	?	?	?	?	?	?
Robinson 2009	?	?	●	?	?	?	?	?	?	?	?
Selme 2008	?	?	●	?	?	?	?	?	?	?	?
Tibaek 2007	●	●	●	?	?	?	?	?	?	?	?
Tienforti 2012	●	?	●	?	?	?	?	?	?	?	?
Tobia 2008	?	?	●	?	?	?	?	?	?	?	?
van Kampen 1998	●	●	?	?	?	?	?	?	?	?	?
Wille 2003	?	?	●	?	?	?	?	?	?	?	?
Yamanishi 2006	●	●	●	?	?	?	?	?	?	?	?
Yokoyama 2004	?	?	?	?	?	?	?	?	?	?	?
Zhang 2007	?	?	●	?	?	?	?	?	?	?	?

Allocation

Sequence generation

Although all trials were identified as RCTs only 24 trials (Ahmed 2012; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Dubbelman 2004; Filocamo 2005; Fode 2014; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Laurienzo 2013; Manassero 2007; Mathewson-Chapman 97; Moore 1999; Moore 2004; Moore 2008; Overgard 2008; Park 2012; Robinson 2008; Robinson 2009; Tibaek 2007; Tienforti 2012; van Kampen 1998; Yamanishi 2006) described a method of adequate sequence generation (for example computer generated random numbers) and were assessed as low risk of bias. The remainder did not provide enough information to make a judgement and were assessed as unclear.

Allocation concealment

Only 20 trials (Ahmed 2012; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Dubbelman 2004; Fode 2014; Geraerts 2013; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Manassero 2007; Moore 1999; Moore 2004; Moore 2008; Overgard 2008; Park 2012; Robinson 2008; Tibaek 2007; van Kampen 1998; Yamanishi 2006) adequately described a technique of allocation concealment (for example sealed envelopes or computerised randomisation) and were assessed as low risk of bias. The remainder did not provide enough information to make a judgement and were assessed as unclear.

Blinding

Blinding was not described in most trials. In complex interventions such as physical therapy it is not possible to blind either the clinicians or the participants from the intervention, however, if blinding did not take place in trials they were judged to be at high risk of bias. This may have an impact on the outcome of interest and was considered while assessing the quality of evidence. Yamanishi 2006 used a sham device for the control group and this was the only trial that was deemed to be at low risk of bias in terms of blinding of participants.

In terms of blinding of personnel:

- 9 trials (Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Geraerts 2013; Moore 1999; Moore 2008; Porru 2001; Tienforti 2012; Yamanishi 2006) were deemed to be at low risk of bias;
- 17 trials (Bales 2000; Filocamo 2005; Floratos 2002; Glazener RP 2011; Glazener TURP 2011; Hou 2013; Joseph 2000; Liu 2008; Manassero 2007; Marchiori 2010; Moore 2004; Overgard 2008; Parekh 2003; Park 2012; Ribeiro 2008;

Robinson 2008; Seleme 2008) were deemed to be at high risk of bias; and

- 23 trials (Ahmed 2012; Dubbelman 2004; Fader 2013; Fode 2014; Franke 1998; Ghanem 2013; Goode 2009; Hoffman 2005; Koo 2009; Laurienzo 2013; Mariotti 2009; Martini 2011; Mathewson-Chapman 97; Morihiko 2011; Nowak 2007; Opsomer 1994; Perissinotto 2008; Robinson 2009; Tobia 2008; van Kampen 1998; Wille 2003; Yokoyama 2004; Zhang 2007) were at unclear risk.

Burgio 2006; Moore 1999 and Moore 2008 indicated that a single therapist, blinded to control group outcomes, provided all treatment. Dijkstra-Eshuis 2013 and Geraerts 2013 reported that the post-operative physiotherapist was blinded to allocation and physical therapy provided by the pre-operative therapist.

In terms of blinding of outcome assessment:

- 7 trials (Burgio 2006; Dijkstra-Eshuis 2013; Geraerts 2013; Moore 2008; Park 2012; Tienforti 2012; Yamanishi 2006) were deemed to be at low risk of bias because they had outcome assessors who were not involved in the provision of the intervention or were not aware of allocation when entering data;
- 1 trial (Fode 2014) was found to be at high risk of bias; and
- 42 trials (Ahmed 2012; Bales 2000; Centemero 2009; Dubbelman 2004; Fader 2013; Filocamo 2005; Floratos 2002; Franke 1998; Ghanem 2013; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Hoffman 2005; Hou 2013; Joseph 2000; Koo 2009; Laurienzo 2013; Liu 2008; Manassero 2007; Marchiori 2010; Mariotti 2009; Martini 2011; Mathewson-Chapman 97; Moore 1999; Moore 2004; Morihiko 2011; Nowak 2007; Opsomer 1994; Overgard 2008; Parekh 2003; Perissinotto 2008; Porru 2001; Ribeiro 2008; Robinson 2008; Robinson 2009; Seleme 2008; Tibaek 2007; Tobia 2008; van Kampen 1998; Wille 2003; Yokoyama 2004; Zhang 2007) were at unclear risk because this information was not provided.

Yamanishi 2006 used a sham device for the control group but there was no statement of whether assessors were aware of this or not.

Incomplete outcome data

Several trials gave no description or did not report dropouts (Centemero 2009; Ghanem 2013; Koo 2009; Marchiori 2010; Morihiko 2011; Perissinotto 2008; Ribeiro 2008; Robinson 2009; Seleme 2008; Yamanishi 2006; Yokoyama 2004), or did not have withdrawals or dropouts (Bales 2000; Liu 2008; Moore 2004; Tobia 2008).

All others reported the number of withdrawals or dropouts, although the reasons were not consistently reported and few, except Moore 2008 and Robinson 2008, discussed how this was dealt with in the analysis. In one trial, outcomes beyond eight weeks

were not available for the control group because all the men were treated, and data were not available for over a third of the men in the other two intervention groups (Goode 2009). Two trials were thought to be at risk of bias because of differential dropout from the randomised groups (Dubbelman 2004; Manassero 2007). One trial (Marchiori 2010) that was judged to be at high risk of bias reported that the survey questionnaire used for one of their outcomes was completed correctly but returned by fewer than 10% of the men.

Six trials (Fader 2013; Martini 2011; Nowak 2007; Perissinotto 2008; Robinson 2008; Robinson 2009) did not provide any usable data. Three of these trials (Nowak 2007; Perissinotto 2008; Robinson 2009) did not report how many men were randomised to each group.

Selective reporting

There was significant difficulty in assessing selective outcome reporting because the protocols for most of the included trials were not available for assessment or could not be found. For a few of the trials, data were not available for some of the outcomes stated in the methods section.

Other potential sources of bias

Information about funding was available for 27 of the included studies (Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Fader 2013; Fode 2014; Franke 1998; Geraerts 2013; Ghanem 2013; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Laurienzo 2013; Moore 1999; Moore 2004; Moore 2008; Morihiro 2011; Overgard 2008; Park 2012; Perissinotto 2008; Ribeiro 2008; Robinson 2008; Robinson 2009; Seleme 2008; Tibaek 2007; van Kampen 1998; Yamanishi 2006; Zhang 2007) and the studies were judged to be at low risk of bias. The rest of the trials were judged to be at unclear risk of bias because there was a lack of information even after contacting the authors.

Thirty-two trials reported obtaining approval from a medical ethics committee (Ahmed 2012; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Dubbelman 2004; Fader 2013; Filocamo 2005; Fode 2014; Geraerts 2013; Ghanem 2013; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Laurienzo 2013; Liu 2008; Manassero 2007; Mathewson-Chapman 97; Moore 1999; Moore 2004; Moore 2008; Morihiro 2011; Overgard 2008; Park 2012; Perissinotto 2008; Ribeiro 2008; Robinson 2008; Robinson 2009; Seleme 2008; Tibaek 2007; Tienforti 2012; Yamanishi 2006; Yokoyama 2004) and were judged to be at low risk of bias. The remaining 18 trials did not report their source of medical ethical approval and were judged to be at unclear risk of bias after no further information was provided by the authors.

Fourteen trials were deemed to be at unclear risk of bias in terms of obtaining informed consent (Bales 2000; Burgio 2006; Hoffman 2005; Hou 2013; Joseph 2000; Koo 2009; Liu 2008; Marchiori

2010; Martini 2011; Nowak 2007; Opsomer 1994; Parekh 2003; Tobia 2008; Zhang 2007). These authors were contacted but no further information on this matter was provided. The other trials did report obtaining informed consent from patients and therefore were deemed to be at low risk of bias for this domain.

Effects of interventions

See: **Summary of findings for the main comparison** Treatment of UI after radical: PFMT ± biofeedback versus no treatment; for postprostatectomy urinary incontinence; **Summary of findings 2** Treatment of UI after radical: electric or magnetic energy versus no treatment for postprostatectomy urinary incontinence; **Summary of findings 3** Treatment of UI after radical: combinations of treatments versus no treatment for postprostatectomy urinary incontinence; **Summary of findings 4** Treatment of UI after radical: one active treatment versus another active treatment for postprostatectomy urinary incontinence; **Summary of findings 5** Prevention of UI after radical: PFMT ± biofeedback versus no treatment for postprostatectomy urinary incontinence; **Summary of findings 6** Prevention of UI after radical: electric or magnetic energy versus no treatment for postprostatectomy urinary incontinence; **Summary of findings 7** Prevention of UI after radical: combinations of treatments versus no treatment for postprostatectomy urinary incontinence; **Summary of findings 8** Prevention of UI after radical: one active treatment versus another active treatment (PFMT pre and post-operation versus PFMT post-operation) for postprostatectomy urinary incontinence; **Summary of findings 9** Prevention of UI after radical: one active treatment versus another active treatment (PFMT + penile vibration pre and post-operation versus PFMT pre and post-operation) for postprostatectomy urinary incontinence; **Summary of findings 10** Prevention of UI after radical: one active treatment versus another active treatment (pre-operative PFMT + electrical stimulation versus pre-operative PFMT) for postprostatectomy urinary incontinence; **Summary of findings 11** Treatment of UI after TURP: PFMT ± biofeedback versus no treatment for postprostatectomy urinary incontinence; **Summary of findings 12** Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment for postprostatectomy urinary incontinence

Radical prostatectomy: treatment of incontinent men after surgery

1. Treatment of UI after radical prostatectomy: post-operative PFMT with or without biofeedback versus no treatment or sham therapy or verbal instruction (Comparison 1)

Nine trials (Dubbelman 2004; Floratos 2002; Franke 1998; Manassero 2007; Glazener RP 2011; Goode 2009; Moore 1999;

Moore 2008; van Kampen 1998) compared PFMT with or without biofeedback to no treatment (sham or verbal instruction) amongst men who had UI after radical prostatectomy. The quality of the evidence is given in [Summary of findings for the main comparison](#).

Differences between trials

All the men were incontinent at baseline.

In one trial (Manassero 2007) there was evidence of unexplained differential dropout from the control group (13 of 53 men, while there were no dropouts from the 54 in the intervention group). The missing men have therefore been assumed to be dry for the purpose of an intention-to-treat analysis. The other trials have been analysed as reported since dropouts (if any) were balanced between the groups.

Sources of heterogeneity

(1) Definition of incontinence varied with each trial:

- more than 1 g urine on one hour pad test (Dubbelman 2004);
- more than 8 g urine loss on 24 hour pad test (Moore 2008);
- more than 2 g urine loss on one hour (van Kampen 1998) or 24 hour pad test (Moore 1999);
- men who were not pad free (Franke 1998);
- a visual analogue score of 10 = completely incontinent and 0 = completely continent (Manassero 2007); or
- no leakage based on bladder diaries (Goode 2009).

(2) The type of PFMT regimens differed between the trials:

- four trials (Dubbelman 2004; Goode 2009; Manassero 2007; Moore 1999) evaluated PFMT alone (without biofeedback);
- three trials evaluated PFMT with biofeedback, verbal instruction (Manassero 2007; Moore 2008) or ES (van Kampen 1998);
- two trials (Floratos 2002; Franke 1998) used PFMT with biofeedback via a perineal patch (surface) EMG.

Formal PFMT post-operative sessions directed by a therapist ranged from: twice a week for 12 weeks (Moore 1999); three times a week for three weeks (Floratos 2002); in up to nine sessions (Dubbelman 2004); weekly for 24 weeks (Moore 2008); four sessions over eight weeks (Goode 2009); five sessions over 16 weeks (Franke 1998); to as long as the UI persisted (van Kampen 1998). Men received only four therapy sessions in three months in one of these trials (Glazener RP 2011) and men in another trial were seen weekly for up to six months (Moore 2008).

(3) Control interventions differed between the trials and included:

- information (verbal or written) about PFMT only (Dubbelman 2004; Floratos 2002; Moore 1999; Moore 2008);
- no treatment (Manassero 2007);

- sham placebo PFMT and contact with therapist (van Kampen 1998);
- monitoring of UI only (e.g. by bladder diary or phone calls) (Franke 1998; Goode 2009).

(4) The participants differed between the trials.

Two trials (Goode 2009; Moore 1999) recruited participants with persistent incontinence (some longer than one year) post-operatively, and these participants may have differed from those enrolled pre-operatively (Moore 2008) but still incontinent at four weeks after surgery) or from those recruited within a week or two of catheter removal (Dubbelman 2004; Floratos 2002; Glazener RP 2011; Manassero 2007; van Kampen 1998) or up to six weeks after radical prostatectomy (Franke 1998).

Incontinence in men and incontinence episodes

Because there was evidence of significant statistical heterogeneity between the trials included in this comparison (see below), meta-analysis was carried out using a random-effects model, therefore widening the CI. There were no significant differences at any time period in the UI rates, and the CIs were wide (for example RR for UI up to 12 months 0.91, 95% CI 0.73 to 1.14, [Analysis 1.1.3](#); and after 12 months 57% with UI versus 62% in the control group, RR 0.85, 95% CI 0.60 to 1.22, [Analysis 1.1.4](#)). Only two trials (Manassero 2007; van Kampen 1998) favoured the treatment and of these, only one (van Kampen 1998) used biofeedback. The estimates from the other trials had CIs that did not rule out clinically important effects. Overall, as one of the pre-defined GRADE-specific outcomes, the quality of evidence for the outcome 'number of incontinent men after 12 months' was found to be moderate. The meta-analysis was dominated by the Glazener RP 2011 trial, which was a large pragmatic multi-centre trial conducted in a context where information on PFMT was widely available. This showed no good evidence to support one-to-one training by a therapist (for example RR for UI after 12 months 0.98, 95% CI 0.87 to 1.09, [Analysis 1.1.4](#)) (Glazener RP 2011). This one large trial had narrow CIs which did not include a clinically significant difference, pre-specified to be 15%. One other trial (Moore 2008) was in line with the Glazener RP 2011 findings but had wider CIs (RR 1.02, 95% CI 0.70 to 1.48, [Analysis 1.1.4](#)) (Moore 2008). In one large trial (Glazener RP 2011), men did not report differences in UI episodes at any time period, based on urinary diary data (for example after 12 months MD 0.1, 95% CI -0.82 to 1.02, [Analysis 1.2.4](#)). Alternatively, one trial (Goode 2009) did report a significant difference, however this measurement was obtained at less than 3 months (MD -1.14, 95% CI -1.46 to -0.82, [Analysis 1.2.1](#)).

Use of pads

Use of pads could be considered to be a measure of more severe incontinence. There was no statistically significant difference in

the number of men using pads in one large trial (40% in intervention group versus 42% in control group after 12 months, RR 0.94, 95% CI 0.72 to 1.22, [Analysis 1.3](#)) ([Glazener RP 2011](#)). [Floratos 2002](#) used number of pad changes over 24 hours as the outcome measure, with no statistically significant difference in the MD between treatment and control groups at any time period ([Analysis 1.4](#)).

Urinary incontinence score and effect on quality of life

In one large trial ([Glazener RP 2011](#)), there was no evidence of a difference in the ICIQ-SF (a composite score of frequency, amount and effect of UI on quality of life) at any time period after the intervention up to or beyond one year (MD after 12 months -0.5, 95% CI -1.35 to 0.35, [Analysis 1.5](#)) or quality of life as a single score from 0 to 10 (MD -0.30, 95% CI -0.73 to 0.13, [Analysis 1.6](#)), however the quality of evidence for this outcome was found to be low.

Pad tests

Two trials ([Moore 1999](#); [Moore 2008](#)) reported 24 hour pad test results and one ([Floratos 2002](#)) reported a one hour pad test. [Dubbelman 2004](#) and [van Kampen 1998](#) also measured urine loss on a 24 hour pad test, but did not report SDs and therefore these data could not be included in the meta-analysis. Amongst the two trials which gave 24 hour pad test data, there were no statistically significant differences between the groups at 3, 6 or 12 months, or after 12 months ([Analysis 1.8](#)). Similarly, using a one hour pad test ([Floratos 2002](#)), there were no statistically significant differences between the groups up to six months ([Analysis 1.9](#)). In the smaller trials ([Floratos 2002](#); [Moore 1999](#); [Moore 2008](#)) the SDs were often larger than the means, suggesting highly skewed data.

2. Treatment of UI after radical prostatectomy: post-operative interventions using electric or magnetic energy (for example post-operative anal ES, perineal ES, TENS, extra-corporeal magnetic innervation (ExMI) versus no treatment or sham treatment (Comparison 2)

Four trials were identified which addressed this comparison ([Marchiori 2010](#); [Moore 1999](#); [Morihiro 2011](#); [Yamanishi 2006](#)). These trials compared anal ES with oral (verbal) PFMT. The control group in Moore's trial received oral information about PFMT only, whereas in Yamanishi's trial the control group also received sham ES. The quality of the evidence is given in [Summary of findings 2](#).

Number of incontinent men

In the short term (less than three months), there were fewer incontinent men in the intervention groups in two trials (64% versus 84% in the control groups, RR 0.77, 95% CI 0.60 to 0.98,

[Analysis 2.1.1](#)) ([Moore 1999](#); [Yamanishi 2006](#)) and the quality of the evidence for this outcome was deemed to be moderate. This remained the same at 6 to 12 months (19% versus 53% in the control groups, RR 0.37, 95% CI 0.18 to 0.73, [Analysis 2.1.3](#)) and after 12 months (7% versus 33% in the control groups of three trials, RR 0.26, 95% CI 0.09 to 0.74). However, the data were too few to be reliable in the longer term.

Adverse effects

One small trial ([Yamanishi 2006](#)) reported adverse effects, with two men in the active ES group and four men in the group receiving sham treatment reporting anal pain or discomfort. No statistically significant differences were found between the groups (RR 0.58, 95% CI 0.11 to 2.90, [Analysis 2.2](#)).

Pad test

There were no statistically significant differences between the groups on grams of urine lost (24 hour pad test) at any of the time points ([Analysis 2.3](#)). Ss were large, indicating skewed distribution of data, and the CIs were wide with evidence of significant statistical heterogeneity.

UI score

Men in the intervention group in one trial ([Yamanishi 2006](#)) had lower (better) UI scores using a quality of life outcome combined with amount and frequency of urine lost (for example MD -3.9, 95% CI -7.15 to -0.65, [Analysis 2.4.3](#), at one year) though this did not quite reach statistical significance when quality of life was analysed on its own (MD -0.40, 95% CI -2.02 to 1.22, [Analysis 2.5](#)).

Time until continence achieved

Men achieved continence on average about 5 months sooner in the intervention group of one trial (MD -4.11 months, 95% CI -6 to -2.23, [Analysis 2.6](#)) ([Yamanishi 2006](#)).

3. Treatment of UI after radical prostatectomy: post-operative lifestyle adjustment versus no treatment or sham treatment (Comparison 3)

No trials were identified.

4. Treatment of UI after radical prostatectomy: post-operative combinations of treatments versus no treatment or sham treatment (Comparison 4)

Two trials reported using PFMT with anal ES as well as biofeedback ([Goode 2009](#); [Opsomer 1994](#)) versus control management. [Goode 2009](#) compared behavioural therapy comprising biofeedback and ES for eight weeks with a control group. [Opsomer 1994](#)

treated incontinent men in the intervention group with two sessions of ES with biofeedback as well as continuing the PFMT taught to both groups at six weeks after radical prostatectomy. The quality of the evidence is given in [Summary of findings 3](#).

Number of incontinent men

[Goode 2009](#) reported fewer incontinent men in the intervention group compared with the control group (83% versus 94% in the control group at less than 3 months, RR 0.88, 95% CI 0.78 to 0.99, [Analysis 4.1.1](#)). In the other trial ([Opsomer 1994](#)), four men in total had incontinence at 3 to 6 months, with 3/20 in the intervention group and 1/19 in the control group, but this was not statistically significant (RR 2.85, 95% CI 0.32 to 25.07, [Analysis 4.2](#)). Overall, the quality of evidence for this outcome was very low.

Adverse events

There were two adverse events (haemorrhoidal irritation) reported by men receiving ES in one trial ([Goode 2009](#)), and the quality of evidence for this outcome was deemed to be of low quality with wide CIs indicating uncertainty (RR 4.86, 95% CI 0.24 to 99.39, [Analysis 4.4.1](#)).

5. Treatment of UI after radical prostatectomy: post-operative use of one treatment versus another active treatment (Comparison 5)

Nine trials comparing one active treatment to another were identified ([Floratos 2002](#); [Goode 2009](#); [Hoffman 2005](#); [Joseph 2000](#); [Koo 2009](#); [Moore 1999](#); [Seleme 2008](#); [Yokoyama 2004](#); [Zhang 2007](#)).

- PFMT plus anal ES (EStim) ([Hoffman 2005](#); [Moore 1999](#)).
- PFMT plus perineal ES (EStim) ([Hoffman 2005](#)).
- PFMT plus visual biofeedback ([Joseph 2000](#); [Zhang 2007](#)).
- PFMT plus visual biofeedback plus support group ([Zhang 2007](#)).
- PFMT plus oral (verbal) biofeedback ([Joseph 2000](#)).
- PFMT plus biofeedback plus ES(Estim) ([Goode 2009](#); [Seleme 2008](#)).
- PFMT alone ([Goode 2009](#); [Hoffman 2005](#); [Koo 2009](#); [Moore 1999](#); [Seleme 2008](#)).
- Extra-corporeal Magnetic Innervation (ExMI) ([Koo 2009](#)).

The quality of the evidence is given in [Summary of findings 4](#).

Number of incontinent men

Four small trials provided data for this outcome ([Goode 2009](#); [Moore 1999](#); [Yokoyama 2004](#); [Zhang 2007](#)). The definition of incontinence varied with each trial:

- no urine loss recorded in bladder diaries ([Goode 2009](#));
- less than 8 g urine loss on 24 hour pad test ([Moore 1999](#));
- 'urine loss' ([Yokoyama 2004](#)); and
- use of pad or brief ([Zhang 2007](#)).

There was no difference in the incontinence rates in the trials at any time period, but CIs were wide, up to 3 months (RR 0.96, 95% CI 0.83 to 1.12, [Analysis 5.1](#)); 3 to 6 months (RR 0.59, 95% CI 0.33 to 1.05, [Analysis 5.2](#)); 6 to 12 months (RR 2, 95% CI 0.21 to 18.23, [Analysis 5.3](#)) and the quality of evidence was deemed to be of very low quality.

Pad tests

For the majority of the comparisons there were no statistically significant differences between the groups, SDs were large, indicating skewed distribution of data, and the CIs were wide.

However, men having extra-corporeal magnetic innervation (ExMI) compared to PFMT alone had less urine loss on the 24 hour pad test at 3 to 6 months in one small trial ([Koo 2009](#)) (compared to PFMT alone, MD -36 g, 95% CI -55 to -17, [Analysis 5.12.3](#)) and used fewer pads per day (MD -0.5, 95% CI -0.79 to -0.21, [Analysis 5.13.1](#)) ([Koo 2009](#)).

Quality of life

In another small trial ([Seleme 2008](#)) men receiving PFMT plus biofeedback plus ES reported better quality of life using the Incontinence Quality of life score than those receiving PFMT alone (MD -28.63, 95% CI -34.60 to -22.66, [Analysis 5.6.1](#)).

In a third trial ([Liu 2008](#)), PFMT supplemented by extra-corporeal magnetic innervation (ExMI) seemed to be better than PFMT alone in terms of quality of life assessed using the ICIQ-SF score (MD -1.60, 95% CI -2.73 to -0.47, [Analysis 5.7.1](#)) but the quality of the evidence for this outcome was judged to be of low quality.

Adverse events

Two men in one trial ([Goode 2009](#)) had an adverse event with ES (haemorrhoidal irritation, RR 5, 95% CI 0.24 to 102.30, [Analysis 5.8.1](#)) but the evidence for this outcome was judged to be of low quality.

Radical prostatectomy: prevention of UI in all men having surgery, intervention before or after prostatectomy or both

6. Prevention of UI after radical prostatectomy: PFMT ± biofeedback versus no treatment or sham therapy or verbal instruction (Comparison 6)

Ten trials addressed this comparison ([Bales 2000](#); [Burgio 2006](#); [Filocamo 2005](#); [Laurienzo 2013](#); [Mathewson-Chapman 97](#); [Overgard 2008](#); [Parekh 2003](#); [Ribeiro 2008](#); [Tienforti 2012](#); [Tobia 2008](#)). The quality of the evidence is given in [Summary of findings 5](#).

Differences between trials

The participants were not selected because they were incontinent so included a mixed population of men with and without incontinence after surgery.

Sources of heterogeneity

(1) The type of PFMT regimens differed between the trials:

- PFMT plus biofeedback (Bales 2000; Burgio 2006; Laurienzo 2013; Mathewson-Chapman 97; Parekh 2003; Ribeiro 2008; Tienforti 2012);
- PFMT alone (Filocamo 2005; Overgard 2008; Tobia 2008).

Biofeedback was delivered via surface electrodes (Bales 2000) or via a digital or anal probe (Burgio 2006; Mathewson-Chapman 97; Parekh 2003; Tienforti 2012). In one trial (Ribeiro 2008) the type of biofeedback was not described.

(2) Control interventions differed between the trials and included:

- no treatment (Filocamo 2005; Mathewson-Chapman 97; Parekh 2003; Tobia 2008);
- post-operative verbal or written instruction on PFMT only (Bales 2000; Laurienzo 2013; Overgard 2008; Ribeiro 2008; Tienforti 2012);
- usual care with simple instructions to interrupt the stream when voiding (Burgio 2006).

(3) The timing of the interventions relative to surgery also varied:

- two trials delivered an intervention before surgery only (Laurienzo 2013; Tobia 2008);
- five trials delivered their intervention before and after surgery (Bales 2000; Burgio 2006; Parekh 2003; Mathewson-Chapman 97; Tienforti 2012);
- three trials delivered their intervention after surgery only (Filocamo 2005; Overgard 2008; Ribeiro 2008).

Number of men with UI

Data describing UI were reported by 8 of the 10 trials. While there was no statistically significant difference at 3 months (Analysis 6.1.1), there was evidence from the findings of this systematic review of an overall benefit from PFMT in the number of men with UI within 6 to 12 months (24% versus 52%, RR 0.51, 95% CI 0.35 to 0.75, Analysis 6.1.3) and after 1 year (10% versus 32%, RR 0.32, 95% CI 0.20 to 0.51, Analysis 6.1.4), but the quality of evidence was judged to be moderate. The data were driven mainly by two trials (Filocamo 2005; Overgard 2008), neither of which included biofeedback. One of these trials did not disclose details of allocation concealment (Filocamo 2005) and the other was small (Overgard 2008). The remaining trials showed conflicting results and there was statistically significant heterogeneity, hence the use of a random-effects model.

Pad changes and pad tests

In the four trials which reported these outcomes (Filocamo 2005; Mathewson-Chapman 97; Overgard 2008; Ribeiro 2008) there was statistical heterogeneity. One small trial favoured PFMT (Ribeiro 2008) but using a random-effects model there was only a significant difference at 6 to 12 months (MD -15 g less urine loss on 24 hour pad test with treatment, 95% CI -18 to -11, Analysis 6.4.3). Men in the intervention group in this trial received PFMT plus biofeedback weekly for three months until they were continent or until three months. The findings from the Filocamo 2005 and Overgard 2008 trials (no significant difference in pad weights) was in contrast to their report of fewer incontinent men with active treatment (RR 0.32, 95% CI 0.20 to 0.51, Analysis 6.1.4). However, the SDs were large and the CIs were wide. Laurienzo 2013 did not find a significant difference up to 12 months when using a 1 hour pad test (MD 19.80, 95% CI -9.15 to 48.75, Analysis 6.3) and comparing PFMT with no standard treatment.

Mean number of incontinence episodes per day

Tienforti 2012 favoured PFMT at all time points (MD -1.43, 95% CI -2.35 to -0.51, Analysis 6.5) when quantifying episodes of UI in men each day, with men in the intervention group suffering fewer mean numbers of episodes.

Quality of life

Quality of life was assessed using the ICIQ-SF by two trials (Laurienzo 2013; Ribeiro 2008) but the quality of the evidence was found to be very low. No significant difference was found within 6 to 12 months (MD -0.69, 95% CI -3.19 to 1.81, Analysis 6.6). Ribeiro 2008 also assessed quality of life using the IIQ, favouring the intervention at 3 to 6 months (MD -2.70, 95% CI -4.88 to -0.52, Analysis 6.7).

7. Prevention of UI after radical prostatectomy: electric or magnetic energy (for example anal ES (ESstim), perineal ES, TENS, extra-corporeal magnetic innervation (ExMI)) versus no treatment or sham treatment (Comparison 7)

One small trial that delivered the intervention pre-operatively only was identified (Laurienzo 2013). There was no significant difference using a 1 hour pad test at 6 to 12 months (MD -1.15, 95% CI -9.11 to 6.81, Analysis 7.1) or when assessing quality of life using the ICIQ-SF (MD 1.60, 95% CI -2.15 to 5.35, Analysis 7.2), but the quality of evidence for this outcome was judged to be very low (Summary of findings 6).

8. Prevention of UI after radical prostatectomy: lifestyle interventions versus no treatment or sham treatment (Comparison 8)

No trials were identified.

9. Prevention of UI after radical prostatectomy: combinations of treatments versus no treatment or sham treatment (Comparison 9)

Only one small trial ([Mariotti 2009](#)) looked at this comparison. Men in the intervention group received PFMT plus ES with biofeedback post-operatively and men in the control group received verbal and written instructions on PFMT. There was a statistical difference with regards to:

- number of incontinent men within 6 to 12 months (RR 0.10, 95% CI 0.01 to 0.73, [Analysis 9.2](#));
- using a 24 hour pad test (MD -24.30, 95% CI -45.02 to -3.58, [Analysis 9.4](#)); and
- time until UI was regained (MD -1.50, 95% CI -2.44 to -0.56, [Analysis 9.5](#)).

However, the quality of evidence for the primary outcome (number of incontinent men) was found to be low ([Summary of findings 7](#)).

Adverse events

Adverse events were not reported.

10. Prevention of UI after radical prostatectomy: one treatment versus another active treatment (Comparison 10)

Eight trials were identified ([Ahmed 2012](#); [Centemero 2009](#); [Dijkstra-Eshuis 2013](#); [Fode 2014](#); [Geraerts 2013](#) [Nowak 2007](#); [Park 2012](#); [Wille 2003](#)). Five of these were new in this update ([Ahmed 2012](#); [Dijkstra-Eshuis 2013](#); [Fode 2014](#); [Geraerts 2013](#); [Park 2012](#)) and one was updated with new information ([Centemero 2009](#)).

- [Ahmed 2012](#) was a three-armed trial, with patients receiving PFMT plus TENS with biofeedback or TENS only or guided PFMT only.
- [Centemero 2009](#) compared PFMT before and after surgery with PFMT delivered after surgery only.
- [Dijkstra-Eshuis 2013](#) compared pre-operative guided PFMT with biofeedback versus post-operative written instructions on PFMT; however all men received PFMT plus biofeedback plus ES if they were still incontinent after six weeks.
- [Fode 2014](#) compared PFMT + penile vibration before and after surgery with PFMT alone before and after surgery: all men received a phosphodiesterase type 5 (PDE5) inhibitor after the first month.
- [Geraerts 2013](#) compared PFMT plus biofeedback versus active PFMT.
- [Nowak 2007](#) compared extra-corporeal magnetic innervation (ExMI) versus PFMT alone but did not provide any useable data.
- [Park 2012](#) compared post-operative PFMT plus general exercise versus post-operative PFMT alone.

- [Wille 2003](#), a three-arm trial, compared PFMT plus ES versus PFMT plus ES plus anal probe biofeedback versus PFMT alone.

The trials were generally small and few were similar enough to combine in a meta-analysis. The quality of the evidence is illustrated in [Summary of findings 8](#).

Number of incontinent men

This outcome was reported by six trials ([Ahmed 2012](#); [Centemero 2009](#); [Dijkstra-Eshuis 2013](#); [Fode 2014](#); [Ghanem 2013](#); [Park 2012](#)).

In one trial, [Centemero 2009](#) reported fewer incontinent men at less than 3 months and within 3 to 6 months when PFMT was delivered pre and post-operatively, compared with post-operatively only, and this correlated with a statistically significant better quality of life score (MD -3.70, 95% CI -6.00 to -1.40, [Analysis 10.15.1](#); MD -4.10, 95% CI -6.64 to -1.56, [Analysis 10.16.1](#)). However, when combined with the data from [Geraerts 2013](#), who used the same interventions, there was no statistically significant difference between the interventions at 3 months (RR 0.86, 0.69 to 1.06, [Analysis 10.1.1](#)) or 3 to 6 months (RR 0.75, 95% CI 0.54 to 1.04, [Analysis 10.2.1](#)). It should be noted that the CIs were very wide. [Ahmed 2012](#) compared three different treatments (PFMT plus transcutaneous electrical stimulation with biofeedback; TENS only; and guided PFMT only) and found no statistically significant differences between the interventions in terms of number of men with UI ([Analysis 10.1](#), [Analysis 10.2](#); [Analysis 10.3](#)) except that at 6 to 12 months PFMT plus ES plus biofeedback proved to be significantly better than PFMT only (RR 0.10, 95% CI 0.01 to 0.76, [Analysis 10.3.3](#)).

One small trial ([Park 2012](#)) found that general exercise added to PFMT was statistically significantly better than PFMT alone within 3 to 6 months (RR 0.48, 95% CI 0.23 to 0.99, [Analysis 10.2.3](#)).

Four trials reported the number of incontinent men after 12 months ([Dijkstra-Eshuis 2013](#); [Fode 2014](#); [Geraerts 2013](#); [Ghanem 2013](#)). The quality of the evidence was moderate ([Summary of findings 8](#)). Three of these trials, comparing pre and post-operative PFMT to post-operative PFMT only, found that more men were incontinent after 12 months when PFMT began before surgery (15.3% versus 10.7% with post-operative training alone) but this did not reach statistical significance (RR 1.32, 95% CI 0.78 to 2.25, [Analysis 10.4.1](#)). The [Fode 2014](#) study was too small to identify a difference between PFMT plus penile vibratory stimulation pre and post-operatively compared with pre and post-operative PFMT ([Analysis 10.4.2](#)).

Pad tests

In general, the short-duration pad tests did not distinguish between the various interventions being compared, apart from in

one trial. At 6 months (but not at 3 months), [Wille 2003](#) found that PFMT plus anal ES both with and without extra biofeedback were both better than PFMT alone using a 20 minute pad test (MD urine lost -3 g, 95% CI -6 to -0.5 in both comparisons, [Analysis 10.8.1](#) and [Analysis 10.8.2](#)), while there was little to choose between the two more intensive interventions ([Analysis 10.8.3](#)). However, the trial was small, the SDs large and the CIs wide.

Using a longer-duration 24 hour pad test, the groups receiving ES were generally better than those only having PFMT or only having ES ([Analysis 10.12](#); [Analysis 10.13](#); [Analysis 10.14](#)) but the interventions were too dissimilar to combine. At three to six months, one small trial ([Park 2012](#)) did not find significant benefit when comparing PFMT plus general exercise with PFMT alone ([Analysis 10.13.4](#)).

Quality of life

ICIQ-SF

The ICIQ-SF score is a mixed measure of both incontinence severity and effect on quality of life. One small trial ([Park 2012](#)) found that there was a significant benefit in terms of the ICIQ-SF and the intervention PFMT plus general exercise versus PFMT alone, but the evidence for this outcome was found to be very low (MD in scores -4.00, 95% CI -5.41 to -2.59, [Analysis 10.16.2](#)).

King's Health Questionnaire

For all domains of the King's Health Questionnaire, [Dijkstra-Eshuis 2013](#) did not find a statistically significant difference between PFMT given pre and post-operatively and PFMT given post-operatively only ([Analysis 10.18](#)).

SF-36

In contrast, one trial ([Park 2012](#)) found that the intervention PFMT with general exercise was favoured at 3 to 6 months when using the health status measure SF-36 (MD -9.00, 95% CI -11.17 to -6.83, [Analysis 10.19.1](#)) compared with PFMT alone. This may have been more of a measure of an effect of exercise on general health than on incontinence itself.

Adverse events

One trial ([Fode 2014](#)) was in the meta-analysis and the authors stated that 5/30 men reported adverse effects in the intervention group using the group with a penile vibratory stimulation device. The quality of evidence for this outcome was deemed to be low. Adverse effects included:

- red spots on the glans penis;
- small laceration with some bleeding;

- soreness;
- frank pain.

TURP: treatment of incontinent men, after surgery

11. Treatment of UI after TURP: PFMT ± biofeedback versus no treatment or sham therapy or verbal instruction (Comparison 11)

One large trial compared PFMT with or without biofeedback to no treatment (sham or verbal instruction) amongst men who had UI after TURP ([Glazener TURP 2011](#)). All the men were incontinent at randomisation, six weeks after surgery, and received four one-to-one sessions with a trained therapist over a three month period. The quality of the evidence is illustrated in [Summary of findings 11](#).

Incontinence in men and incontinence episodes

There were no significant differences at any time period in the incontinence rates (for example RR for incontinence up to 12 months 1.04, 95% CI 0.90 to 1.20, [Analysis 11.1.3](#); and after 12 months, 65% with UI versus 62% in the control group, RR 1.05, 95% CI 0.91 to 1.23, [Analysis 11.1.4](#)). The evidence was judged to be moderate.

In one large trial ([Glazener TURP 2011](#)) men did not report differences in incontinence episodes at any time period, based on urinary diary data (for example after 12 months MD 0.2, 95% CI -0.27 to 0.67, [Analysis 11.2](#)).

Use of pads

Use of pads could be considered to be a measure of more severe incontinence. There was no statistically significant difference in the number of men using pads in one large trial (16% in intervention group versus 18% in control group after 12 months, RR 0.93, 95% CI 0.56 to 1.56, [Analysis 11.3](#)) ([Glazener TURP 2011](#)).

Urinary incontinence score and effect on quality of life

In one large trial ([Glazener TURP 2011](#)), there was no evidence of a difference in the ICIQ-SF (a composite score of frequency, amount and effect of UI on quality of life) at any time period after the intervention up to or beyond one year (for example MD after 12 months -0.1, 95% CI -0.89 to 0.69, [Analysis 11.4](#)) or quality of life as a single score from 0 to 10 (MD -0.1, 95% CI -0.51 to 0.31, [Analysis 11.5](#)). The quality of evidence for this outcome was deemed to be low.

Adverse events

No adverse events were reported.

12. Treatment of UI after TURP: electric or magnetic energy (for example anal ES (EStim), perineal ES, TENS, extra-corporeal magnetic innervation (ExMI)) versus no treatment or sham treatment (Comparison 12)

No trials were identified.

13. Treatment of UI after TURP: lifestyle interventions versus no treatment or sham treatment (Comparison 13)

No trials were identified.

14. Treatment of UI after TURP: combinations of treatments versus no treatment or sham treatment (Comparison 14)

No trials were identified.

15. Treatment of UI after TURP: one treatment versus another active treatment (Comparison 15)

No trials were identified.

TURP: prevention of UI in all men having surgery, intervention before or after prostatectomy, or both

16. Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment or sham therapy or verbal instruction (Comparison 16)

Three small trials enrolled men before TURP for benign prostatic hyperplasia (Hou 2013; Porru 2001; Tibæk 2007). Men in the intervention groups in both trials received one session with a therapist before surgery to teach them the correct contractions (using verbal biofeedback) and they were expected to practice PFMT afterwards. In the second trial (Tibæk 2007), men also attended three group teaching sessions. The control groups received information only. The quality of the evidence is illustrated in [Summary of findings 12](#).

There were no statistically significant differences between the groups in the number of men with incontinence at less than 3 months or 3 to 6 months, but the CIs were wide and the quality of evidence was very low (< 3 months RR 0.60, 95% CI 0.21 to 1.77, [Analysis 16.1.1](#); 3 to 6 months RR 0.51, 95% CI 0.14 to 1.89, [Analysis 16.1.2](#)).

Quality of life

One trial (Hou 2013) measured quality of life using a health status measure Short-Form 36 (SF-36) questionnaire at three to six months. No statistically significant differences were found on any of the domains apart from those associated with mental health ([Analysis 16.2](#)).

17. Prevention of UI after TURP: electric or magnetic energy (for example anal ES (EStim), perineal ES, TENS, extra-corporeal magnetic innervation (ExMI)) versus no treatment or sham treatment (Comparison 17)

No trials were identified.

18. Prevention of UI after TURP: lifestyle interventions versus no treatment or sham treatment (Comparison 18)

No trials were identified.

19. Prevention of UI after TURP: combinations of treatments versus no treatment or sham treatment (Comparison 19)

No trials were identified.

20. Prevention of UI after TURP: one treatment versus another active treatment (Comparison 20)

No trials were identified.

Containment of UI (all men with residual UI)

21. External penile compression devices (penile clamps) versus no treatment or sham treatment (Comparison 21)

One trial compared three different penile compression devices (Cunningham clamp, U-Text Male Adjustable Tension Band, and C3 penile compression device) with a control period of no device (Moore 2004). A randomised block assignment was used with a multiple period cross-over design, so that each of the 12 participants had a control period of no device and three periods in which the different devices were used.

All external compression devices reduced the weight of urine lost on a four hour pad test compared to the control period ($P < 0.05$, [Analysis 21.2](#)), but none completely eliminated urine loss. Satisfaction was based on ease of application, comfort and efficacy. The device preferred by the largest number of men ([Analysis 21.1](#)) was also that with the lowest urine loss (the Cunningham clamp) ([Analysis 21.2](#)).

Adverse events

The Cunningham clamp was also the device with the greatest reduction in systolic blood flow velocity ($P < 0.05$ versus control period, [Analysis 21.3](#); [Analysis 21.4](#)), raising the possibility of safety issues if applied too tightly. In the trial, men were able to judge when to release the device. The authors recommended that its use should therefore be limited to men who were cognitively intact, aware of bladder filling, had normal genital sensation and

intact penile skin, and had sufficient manual dexterity to open and close the device ([Moore 2004](#)).

In another trial with no useable data ([Fader 2013](#)), men provided qualitative information which suggested that pads were most highly rated compared with sheath catheters ($P = 0.31$), clamps ($P < 0.01$) and the body-worn urinal ($P < 0.001$). The clamp was rated as more secure, less leaky and less restrictive on clothing choice than the others ($P < 0.05$) but was more painful than the rest ($P < 0.002$).

ADDITIONAL SUMMARY OF FINDINGS *[Explanation]*

Treatment of UI after radical: electric or magnetic energy versus no treatment for postprostatectomy UI						
Patient or population: Patients with postprostatectomy UI Intervention: Treatment of UI after radical: electric or magnetic energy versus no treatment						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Treatment of UI after radical: electric or magnetic energy versus no treatment				
Number of incontinent men - after 12 months	63 per 1000	16 per 1000 (6 to 47)	RR 0.26 (0.09 to 0.74)	413 (3 studies)	⊕⊕⊕○ moderate ^{1,2}	
Urinary Incontinence Score (ICIQ-SF UI score) - after 12 months		The mean urinary incontinence score (icIQ-short form ui score) - after 12 months in the intervention groups was 1.4 lower (5.03 lower to 2.23 higher)		47 (1 study)	⊕⊕○○ low ^{2,3,4}	
Uri-nary Incontinence Quality of Life Score (ICIQ-SF) - after 12 months	See comment	See comment	Not estimable	47 (1 study)	⊕⊕○○ low ^{2,3,5}	
Adverse events	133 per 1000	77 per 1000 (15 to 387)	RR 0.58 (0.11 to 2.9)	56 (1 study)	⊕⊕○○ low ^{2,3,6}	

Economic analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment
--	-------------	-------------	---------------	---	-------------

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

¹ Random sequence generation and allocation concealment unclear is 1/2 trials taking part in the meta-analysis

² Funnel plot could not be used as there are fewer than 10 trials

³ Not applicable. Only one trial

⁴ 95% CI very wide (-5.03 to 2.23)

⁵ 95% CI very wide (-2.02 to 1.22)

⁶ 95% CI very wide (0.11 to 2.90)

Treatment of UI after radical: combinations of treatments versus no treatment for postprostatectomy UI						
Patient or population: patients with postprostatectomy UI Intervention: Treatment of UI after radical: combinations of treatments versus no treatment						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Treatment of UI after radical: combinations of treatments versus no treatment				
Number of incontinent men with 3 to 6 months	53 per 1000	150 per 1000 (17 to 1000)	RR 2.85 (0.32 to 25.07)	39 (1 study)	⊕○○○ very low ^{1,2,3,4}	
Uri-nary Incontinence Quality of Life Score (ICIQ-SF) after 12 months	Study population		Not estimable	0 (0)	See comment	
	See comment	See comment				
	Moderate					
Adverse events - PFMT + anal ESTim + BFB	0 per 1000	0 per 1000 (0 to 0)	RR 4.86 (0.24 to 99.39)	138 (1 study)	⊕⊕○○ low ^{2,4,5}	
Economic Analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence interval; **RR:** Risk ratio

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

- ¹ Random sequence generation and allocation concealment unclear
- ² Not applicable, only one trial
- ³ No explanation was provided
- ⁴ Funnel plot cannot be used as there is only one trial
- ⁵ 95% CI is very wide (0.24 to 99.39)

Treatment of UI after radical: one active treatment versus another active treatment for postprostatectomy UI						
Patient or population: Patients with postprostatectomy UI Intervention: Treatment of UI after radical: one active treatment versus another active treatment						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Treatment of UI after radical: one active treatment versus another active treatment				
Number of incontinent men within 6 to 12 months - FES versus ExMI	83 per 1000	167 per 1000 (17 to 1000)	RR 2 (0.21 to 19.23)	24 (1 study)	⊕○○○ very low ^{1,2,3,4,5}	
Quality of Life Score (ICI-Q-SF) within 6 to 12 months - PFMT + ExMI versus PFMT		The mean quality of life score (ICI-Q-SF) within 6 to 12 months - PFMT + ExMI versus PFMT in the intervention groups was 1.6 lower (2.73 to 0.47 lower)		24 (1 study)	⊕⊕○○ low ^{1,2,5,6}	
Adverse events PFMT + Anal EStim versus PFMT alone	0 per 1000	0 per 1000 (0 to 0)	RR 5 (0.24 to 102.3)	140 (1 study)	⊕⊕○○ low ^{2,5,7}	
Economic analysis using QALY	Study population		Not estimable	0 (0)	See comment	
	See comment	See comment				
	Moderate					

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

- ¹ Random sequence generation and allocation concealment is unclear
- ² Not applicable, only one trial
- ³ GRADE-specific outcome was number of incontinent men after 12 months
- ⁴ 95% CI is very wide (0.21 to 19.23)
- ⁵ Funnel plot cannot be used as there was only one trial
- ⁶ GRADE-specific outcome was ICI-Q-SF after 12 months
- ⁷ 95% CI very wide (0.24 to 102.30)

Prevention of UI after radical: PFMT ± biofeedback versus no treatment compared to for UI						
Patient or population: All men after radical prostatectomy Intervention: Prevention of UI after radical: PFMT ± biofeedback versus no treatment Comparison:						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
		Prevention of UI after radical: PFMT ± biofeedback versus no treatment				
Number of incontinent men - after 12 months	321 per 1000	103 per 1000 (64 to 164)	RR 0.32 (0.2 to 0.51)	373 (2 studies)	⊕⊕⊕○ moderate ^{1,2}	
Quality of life score assessed using (ICI-SF UI score) - within 6 to 12 months		The mean quality of life score assessed using (ICI-SF UI score) - within 6 to 12 months in the intervention groups was 0.69 lower (3.19 lower to 1.81 higher)		105 (2 studies)	⊕○○○ very low ^{2,3,4}	
Adverse events - not reported	See comment	See comment	Not estimable	-	See comment	
Economic analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; RR: Risk ratio

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

¹ Allocation concealment is unclear for Filocamo 2005 which contributes 84.2% weightage

² Funnel plot cannot be used as there are fewer than 10 trials

³ Sequence generation is unclear in Ribeiro 2008. Allocation concealment is unclear in both the trials taking part in the meta-analysis

⁴ 95% CI is very wide (-3.19 to 1.81)

Prevention of UI after radical: electric or magnetic energy versus no treatment for UI						
Patient or population: All men after radical prostatectomy Intervention: Prevention of UI after radical: electric or magnetic energy versus no treatment						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Prevention of UI after radical: electric or magnetic energy versus no treatment				
Number of incontinent men after 12 months - not reported	See comment	See comment	Not estimable	-	See comment	
Quality of life score assessed using (ICIQ-SF score) - within 6 to 12 months	See comment	See comment	Not estimable	32 (1 study)	⊕○○○ very low ^{1,2,3}	
Adverse events - not reported	See comment	See comment	Not estimable	-	See comment	
Economic analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence interval;

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

¹ Allocation concealment is unclear

² 95% CI is very wide (-2.15 to 5.35)

³ Funnel plot cannot be used as there are fewer than 10 trials

Prevention of UI after radical: combinations of treatments versus no treatment compared to for postprostatectomy UI						
Patient or population: All men after radical prostatectomy Intervention: Prevention of UI after radical: combinations of treatments versus no treatment						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
		Prevention of UI after radical: combinations of treatments versus no treatment				
Number of incontinent men within 6 to 12 months - PFMT + anal EStim + biofeedback versus no treatment	See comment	See comment	Not estimable	60 (1 study)	⊕⊕○○ low ^{1,2}	
Quality of life Score assessed using (ICIQ-SF) or (ICIQ- SF UI score) - not reported	See comment	See comment	Not estimable	-	See comment	
Adverse events - not reported	See comment	See comment	Not estimable	-	See comment	
Economic analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence interval;

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

¹ Sequence generation and allocation concealment are both unclear

² Funnel plot cannot be used as there are fewer than 10 trials

Prevention of UI after radical: one active treatment versus another active treatment compared to (PFMT pre and post-operation versus PFMT post-operation) for UI						
Patient or population: All men after radical prostatectomy Intervention: Prevention of UI after radical: one active treatment versus another active treatment Comparison: (PFMT pre and post-operation versus PFMT post-operation)						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	(PFMT pre and post-operation versus PFMT post-operation)	Prevention of UI after radical: one active treatment versus another active treatment				
Number of incontinent men after 12 months	See comment	See comment	Not estimable	367 (3 studies)	⊕⊕⊕○ moderate ^{1,2}	
Quality of Life Score assessed using (ICIQ-SF) or (ICIQ-SF UI score) after 12 months - not reported	See comment	See comment	Not estimable	-	See comment	
Adverse events	See comment	See comment	Not estimable	102 (1 study)	⊕⊕⊕⊕ high ^{3,4,5}	
Economic Analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence interval

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

- ¹ Sequence generation is unclear 2/3 trials and allocation concealment is unclear in 1/3 trials
- ² Due to clinical heterogeneity we decided not to pool the results
- ³ Not applicable
- ⁴ RR is not estimable as there is zero event in both arms of the trial
- ⁵ Funnel plot cannot be used as there were fewer than 10 trials

Prevention of UI after radical: one active treatment versus another active treatment compared to (PFMT + penile vibration pre and post-operation versus PFMT pre and post-operation) for						
Patient or population: All men after radical prostatectomy Intervention: Prevention of UI after radical: one active treatment versus another active treatment Comparison: PFMT + penile vibration pre and post-operation versus PFMT pre and post-operation)						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	(PFMT + penile vibration pre and post-operation versus PFMT pre and post-operation)	Prevention of UI after radical: one active treatment versus another active treatment				
Number of incontinent men after 12 months	71 per 1000	100 per 1000 (18 to 555)	RR 1.4 (0.25 to 7.77)	58 (1 study)	⊕⊕○○ low ^{1,2,3}	
Quality of life Score assessed using (ICIQ-SF) or (ICIQ-SF UI score)	Study population		Not estimable	0 (0)	See comment	
	See comment	See comment				
	Moderate					
Adverse events	See comment	See comment	Not estimable	68 (1 study)	⊕⊕○○ low ^{1,3,4}	
Economic analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; RR: Risk ratio

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

¹ Not applicable

² 95% CI very wide (0.25 to 7.77)

³ Funnel plot cannot be used as there were fewer than 10 trials

⁴ 95% CI is very wide (0.80 to 240.77)

Prevention of UI after radical: one active treatment versus another active treatment compared to (pre-operative PFMT + electrical stimulation versus pre-operative PFMT) for UI

Patient or population: All men after radical prostatectomy

Intervention: Prevention of UI after radical: one active treatment versus another active treatment

Comparison: Pre-operative PFMT + electrical stimulation versus pre-operative PFMT

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	(pre-operative PFMT + electrical stimulation versus pre-operative PFMT)	Prevention of UI after radical: one active treatment versus another active treatment				
Number of incontinent men after 12 months - not reported	See comment	See comment	Not estimable	-	See comment	
Quality of Life Score assessed using (ICIQ-SF) within 6 to 12 months	See comment	See comment	Not estimable	34 (1 study)	⊕○○○ very low ^{1,2,3,4}	
Adverse events - not reported	See comment	See comment	Not estimable	-	See comment	
Economic analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

¹ Allocation concealment is unclear

² Not applicable

³ 95% CI very wide (-3.13 to 4.13)

⁴ Funnel plot cannot be used as there were fewer than 10 trials

Treatment of UI after TURP: PFMT ± biofeedback versus no treatment compared to for UI						
Patient or population: Men with UI after TURP Intervention: Treatment of UI after TURP: PFMT ± biofeedback versus no treatment						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
		Treatment of UI after TURP: PFMT ± biofeedback versus no treatment				
Number of incontinent men- after 12 months	See comment	See comment	Not estimable	1609 (1 study)	⊕⊕⊕○ moderate ^{1,2,3}	
Quality of life Score assessed using Score (ICIQ-SF UI score) - after 12 months	See comment	See comment	Not estimable	397 (1 study)	⊕⊕○○ low ^{1,3,4}	
Adverse events - not reported	See comment	See comment	Not estimable	-	See comment	
Economic analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

- ¹ Not applicable
- ² 95% CI is wide (0.91 to 1.23)
- ³ Funnel plot cannot be used as there are fewer than 10 trials
- ⁴ 95% CI is very wide (-0.89 to 0.69)
- ⁵ GRADE specific outcome is IIEF score
- ⁶ 95% CI is very wide (0.86 to 1.72)

Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment for UI						
Patient or population: All men after TURP Intervention: Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment				
Number of incontinent men - within 3 to 6 months	227 per 1000	116 per 1000 (32 to 430)	RR 0.51 (0.14 to 1.89)	48 (1 study)	⊕○○○ very low ^{1,2,3,4}	
Urinary Incontinence Score assessed using (ICIQ-SF) or (ICIQ-SF UI score) at 12 months - not reported	See comment	See comment	Not estimable	-	See comment	
Adverse events - not reported	See comment	See comment	Not estimable	-	See comment	
Economic analysis using QALY - not reported	See comment	See comment	Not estimable	-	See comment	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence interval; **RR:** Risk ratio

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect.

Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.

Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.

Very low quality: We are very uncertain about the estimate.

¹ Not applicable

² GRADE specific outcome was number of incontinent men after 12 months

³ 95% CI is very wide (0.14 to 1.89)

⁴ Funnel plot cannot be used as there are fewer than 10 trials

DISCUSSION

This review incorporates a broad array of possible interventions under the umbrella term of conservative management of post-prostatectomy UI. The populations studied included men undergoing prostatectomy for both benign (TURP) and malignant (radical prostatectomy) disease. The interventions were delivered pre-operatively, post-operatively or both. In some trials all the men were incontinent at baseline, while at least some were dry in other trials which recruited all men having surgery (these were classed as prevention of incontinence trials). Seven trials (Goode 2009; Joseph 2000; Moore 1999; Moore 2004; Opsomer 1994; Seleme 2008; Zhang 2007) included men who had been incontinent for a considerable time after surgery while the rest recruited men around the time of surgery. More recent trials have focused on the pre-operative or post-operative period immediately after catheter removal. It is acknowledged that UI after prostatectomy will resolve over time in many men.

Conservative interventions tend to be resource-intensive strategies that require people, equipment and clinic space, so administrators will look for evidence of efficacy. Funding has been an issue given the inconclusive nature of the evidence to date. For example, in the United States, the centres for both Medicare and Medicaid services have considered whether to withdraw funding for biofeedback and pelvic floor electrical stimulation (ES) in the treatment of UI of any etiology based on a lack of evidence regarding effectiveness. Through a lobbying effort from service providers and manufacturers, these modalities continued to be covered in the United States (Thompson 2002). However, as controversy about funding is likely to continue, there is a need for continued research in the area to determine which groups of patients are most likely to benefit from conservative interventions.

The findings of this review should continue to be treated with caution. The effectiveness of conservative measures in the longer term or in men with persistent UI remain inconclusive.

Summary of main results

Fifty trials met the inclusion criteria, 45 trials amongst men after radical prostatectomy, four trials after TURP, and one small trial which included one man with benign disease but was classed as a radical prostatectomy trial. There was considerable variation in the interventions, populations and outcome measures. Given this clinical heterogeneity it was decided to differentiate the trials and the comparisons, by type of surgery (TURP or radical prostatectomy) and by whether the intervention was partly preventative (in that not all men were incontinent, for example if all men before or after surgery were recruited, $N = 27$ trials), for treatment only (when all included men were incontinent at baseline, $N = 23$ trials) or for containment (external penile compression devices, $N = 2$ trials). Although the International Prostate Score (IPSS) was

used in many of the trials, the authors felt that this questionnaire did not assess UI and therefore was not included in the outcome of quality of life.

Treatment trials for urinary incontinence after radical prostatectomy

Twenty-one trials investigated the effects of PFMT versus no treatment or a variety of other means of stimulating the pelvic floor muscles. There was considerable clinical and statistical heterogeneity in the populations and the timing and frequency of the interventions, hence a random-effects model was chosen for most of the comparisons where meta-analysis was possible. Only two trials (Manassero 2007; van Kampen 1998) showed a statistically significant benefit from active treatment versus no treatment control groups (at 12 months and within 6 to 12 months respectively), and the other trials showed conflicting results. There was differential dropout from the control group in the Manassero 2007 trial (these men were assumed to be dry for analysis purposes). Additionally, men in the experimental group in the van Kampen 1998 trial received one session of PFMT in hospital before discharge and were then seen by a physiotherapist for one to two weeks, whereas those in the Manassero 2007 trial were taught PFMT by two urologists using verbal feedback and instructed to perform contractions at home. Because of the heterogeneity a random-effects model was used, which led to wider confidence intervals (CIs).

Overall, there was not enough evidence to say whether or not PFMT with or without biofeedback was effective as the CIs were wide (for example number of men with incontinence in the intervention groups 193/339 (57%) versus 203/326 (62%) in the control groups, RR for incontinence after 12 months 0.85, 95% CI 0.60 to 1.22, Analysis 1.1.4).

The meta-analysis was dominated by the Glazener RP 2011 trial, which was a large pragmatic multi-centre trial conducted in a context where information on PFMT was widely available. This showed no good evidence to support one-to-one training by a therapist (for example RR for UI after 12 months 0.98, 95% CI 0.87 to 1.09, Analysis 1.1.4) (Glazener RP 2011). This one large trial had narrow CIs which did not include a clinically significant difference, pre-specified to be 15%. The only other large trial (Moore 2008) was in line with the Glazener RP 2011 findings but with wider CIs (RR 1.02, 95% CI 0.70 to 1.48, Analysis 1.1.4) (Moore 2008) despite a more intensive intervention. While men in the Glazener RP 2011 trial had four therapy sessions over three months, in the Moore 2008 trial men were seen weekly for up to six months. The findings in these two trials concurred despite different intensities of intervention, and the quality of evidence for this GRADE-specific outcome was moderate. Data from quality of life measures and use of pads and pad tests supported the finding of no differences between intervention and control groups.

Three small trials provided data and the meta-analysis suggested that ES was better than control interventions in terms of less incontinence, regaining continence more quickly and better quality

of life, at least in the short term up to six months. The quality of evidence was deemed to be moderate, however less information was available for the longer term.

Individual small trials provided data to suggest that extra-corporal magnetic innervation (ExMI) or combinations of treatments might be beneficial but the evidence was limited.

Prevention trials for urinary incontinence after radical prostatectomy

Nineteen trials, some of which enrolled men before surgery and others all men as soon as the catheter was removed, included a mixed population of men with and without incontinence after surgery. Again a random-effects model was chosen to compensate for the considerable clinical and statistical heterogeneity between the trials. Including the information from the quasi-randomised trial (Filocamo 2005), the chance of incontinence appeared to be lower in the intervention groups in two trials with data after 12 months. The quality of evidence was judged to be moderate (number of men with UI after one year 10.2% versus 32.1% in the control groups, RR 0.32, 95% 0.20 to 0.51, Analysis 6.1.4). The meta-analysis of prevention trials included a number of small trials with wide CIs apart from Filocamo 2005, which was out of line with the others. This was the only large trial to favour the intervention group. The worry is that this trial may have been biased due to a lack of reporting on concealment of allocation.

One small trial (Ribeiro 2008) suggested that men were more likely to be carrying out PFMT, at least soon after the intervention (Analysis 6.9), though this was not reflected in significant differences in higher anal squeeze pressures (Analysis 6.8). Another trial of anal ES was too small to be conclusive (Laurienzo 2013). One small trial (Mariotti 2009) reported that adding anal ES and biofeedback to PFMT was beneficial. One further small trial (Wille 2003) found that PFMT plus anal ES with and without extra biofeedback were both better than PFMT alone at six months, but there was little to choose between the two more intensive interventions (Analysis 10.8). Tienforti 2012 found that pre-operative PFMT was associated with a reduction in number of incontinence episodes per day, but this was a small trial and larger sample sizes would be needed to draw reliable conclusions. Nine trials compared one active treatment with another active treatment. Overall there did not seem to be one intervention that proved to be statistically significantly better than another.

Treatment trials for urinary incontinence after TURP

One large trial addressed this comparison (Glazener TURP 2011), comparing four sessions of one-to-one therapy with standard management in a context where information about PFMT was widely available. The quality of evidence for the number of incontinent men was moderate but there were no differences between the groups in any of the outcome measures except for performance of

PFMT, suggesting that the intervention had changed behaviour but not incontinence or other clinical outcomes.

Prevention trials for urinary incontinence after TURP

Three small trials enrolled men before TURP to receive a minimal PFMT intervention before and after surgery. There were no statistically significant differences in terms of number of incontinent men between the groups but the quality of evidence was deemed to be very low (Analysis 16.1).

Containment of urinary incontinence

One alternative intervention, a clamp fitted to the shaft of the penis, can be used to control unwanted leakage. Men in one trial reported a preference for one type of external compression device compared to two others or no treatment; a Cunningham clamp proved satisfactory to 10 of 12 men with intractable UI (Moore 2004). This may be a viable alternative for some cognitively capable men providing they take into account safety issues such as adequate sensation and the ability to remove the device when it feels too tight or the bladder is full. Another trial which compared pads, sheath catheters, body-worn urinals and clamps also reported that men found the clamps most effective but painful (Fader 2013). Men whose incontinence cannot be otherwise controlled can use absorbent pads (Fader 2007; Fader 2008) or a variety of external sheath devices with leg bags. An alternative is an indwelling urinary catheter (Jahn 2007; Moore 2007; Niël-Weise 2005).

Lifestyle changes

The effect of other conservative interventions such as lifestyle changes remains undetermined as no trials involving these interventions were identified.

Overall completeness and applicability of evidence

Few trials used the primary outcomes of interest, patient reported symptoms and the standardised pad test. Most used a variety of subjective outcomes derived from patient reported symptoms to define continence. There were no trials which examined lifestyle adjustments in alleviating UI after prostatectomy.

Attrition bias may have played a role in the results of some of the included trials and therefore affected the outcome of this review. One of the smaller trials (Franke 1998) lost half of the randomised participants by the end of the data collection period. Although most of those trials that lost participants provided an explanation of these losses, none accounted for the missing data in their primary analyses. The intention-to-treat principle mandates, at minimum, that patients stay in the group to which they are randomised (Juni 2001), which the included trials appeared to do. It is also suggested that primary outcomes for all patients randomised to

groups should be recorded or estimated if not available. Three of the included trials (Filocamo 2005; Moore 2008; Parekh 2003) reported an analysis using the intention-to-treat principle, and one trial (Burgio 2006) used survivor analysis in the original trial analysis. In one trial where there was clear evidence of differential dropout (Manassero 2007), the review authors elected to assume that the men whose data were missing were continent. However, attrition bias may have affected a number of the other trials which did not present relevant data or discuss the issue.

In 21 trials in this review, men who were all incontinent were analysed together. However, in seven of these trials (Goode 2009; Joseph 2000; Moore 1999; Moore 2004; Opsomer 1994; Seleme 2008; Zhang 2007) men had longstanding or persistent incontinence. It is possible that they might respond differently to the interventions compared to men recruited around the time of prostate surgery.

Quality of the evidence

Trial quality and methodological assessment

The quality of the estimated treatment effect of any intervention is determined partly by methodological assessment. Methodological flaws within the included trials of this review were assessed using the reports of the trials and therefore were reliant on the quality of reporting. Data were not available in all the trials for many of the pre-stated outcomes. CIs tended to be wide except for the more recent large trials, and it was difficult to reliably identify or rule out a useful effect.

All trials claimed to be randomised, but only 24 out of 50 trials provided details of adequate sequence generation (Ahmed 2012; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Dubbelman 2004; Filocamo 2005; Fode 2014; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Laurienzo 2013; Manassero 2007; Mathewson-Chapman 97; Moore 1999; Moore 2004; Moore 2008; Overgard 2008; Park 2012; Robinson 2008; Robinson 2009; Tibaek 2007; Tienforti 2012; van Kampen 1998; Yamanishi 2006). Only 20 of the 50 trials provided details of adequate concealment of randomisation (Ahmed 2012; Burgio 2006; Centemero 2009; Dijkstra-Eshuis 2013; Dubbelman 2004; Fode 2014; Geraerts 2013; Glazener RP 2011; Glazener TURP 2011; Goode 2009; Manassero 2007; Moore 1999; Moore 2004; Moore 2008; Overgard 2008; Park 2012; Robinson 2008; Tibaek 2007; van Kampen 1998; Yamanishi 2006) and were subsequently judged to be at low risk of selection bias. Additionally, blinding to PFMT was not possible, and blinding of outcome assessment appeared to be absent in many trials as it was not discussed. Therefore, many trials were judged to be at high risk of performance and detection bias.

The quality of the evidence was downgraded for the following.

- Study design i.e. there was evidence of methodological flaws in the study design.
- Indirectness i.e. a surrogate outcome was selected when a GRADE-specific outcome was not reported.
- Inconsistency, when there was evidence of statistical (either clinical or methodological) heterogeneity.
- Imprecision, when the CI was wide and crossed the line of no effect.
- Publication bias. We planned to use funnel plot for publication bias, however, there were fewer than 10 trials in the meta-analysis and the funnel plot could not be used.

The quality of the evidence for the critical outcomes ranged from moderate to very low, as evident in the summary of findings tables.

Potential biases in the review process

All relevant databases were searched and no language restriction was imposed during the search process, which enabled as many potentially eligible trials as possible to be included. Some reports of trials may not be published and therefore the full extent of the data may not have been obtained. One of the review authors was involved in four of the included trials and another review author was involved in two of the included trials. In order to account for this potential bias in the review process, data extraction and risk of bias assessment were performed by two independent review authors, one of whom was not involved in any of the included trials.

Agreements and disagreements with other studies or reviews

A systematic review conducted by Macdonald et al (MacDonald 2007) was identified which addressed conservative management of post-prostatectomy urinary incontinence. Macdonald and colleagues included 11 trials (Bales 2000; Burgio 2006; Filocamo 2005; Floratos 2002; Franke 1998; Mathewson-Chapman 97; Moore 1999; Parekh 2003; van Kampen 1998; Wille 2003; Yokoyama 2004), all of which were included in this review. They did not distinguish between treatment and prevention trials. Macdonald and colleagues' review analysed PFMT and PFMT with biofeedback, focusing on any additional benefit from biofeedback. The authors concluded that the use of guided PFMT was associated with superior patient outcomes compared with no treatment, which differs from the findings of this review. The Macdonald and colleagues review did not include more recent trials because the MEDLINE search only included trials up to 2006. Additionally, the conclusions made in Macdonald's review may have differed because the authors did not utilise the GRADE approach, suggesting the quality of the evidence was not assessed.

AUTHORS' CONCLUSIONS

Implications for practice

In keeping with conclusions from earlier versions of this review, at this point there remains no clear support that conservative management of any type is helpful for postprostatectomy UI whether delivered as treatment to men who are incontinent or as prevention to all men undergoing radical prostatectomy. The individual result of one large multi-centre trial on its own did have narrow confidence intervals which did not include a clinically significant difference (of 15%) in the rate of incontinence between the groups. It seems unlikely that men benefit from one-to-one PFMT therapy after TURP.

Some small trials provided data to suggest that electrical stimulation was better than control interventions (in one trial including sham electrical stimulation), or active interventions which did not include electrical stimulation, at least in the short term up to six months. Individual small trials provided data to suggest that extra-corporeal magnetic innervation (ExMI) or combinations of treatments might be beneficial but the evidence was limited.

The trials suffered from a lack of standardised outcome measures. Definitions of incontinence, measurement of quality of life and types of pad tests (20 minute, 1 hour, 24 hour, number of pads, weight of pads, number of men using pads and so on) varied in almost every trial. The timing for measuring the primary outcome should be at least 1 year.

No trials have tested the effect of lifestyle changes alone. Long-term UI may be managed by absorbent pads or external penile clamps, but there are safety problems with clamps.

This review did not find sufficient evidence as to whether or not conservative management is effective in treating or preventing postprostatectomy UI.

Implications for research

Urinary incontinence (UI) after prostatectomy is a distressing problem and, although conclusive evidence does not exist, conservative approaches form part of current management. Well-designed clinical trials are still needed to clarify the role of these therapies. In addition, men with persistent severe UI could consider surgical treatment for example with an artificial urinary sphincter or male sling. However, these surgical options should also be tested in RCTs as there is currently not enough evidence to support their use (Silva 2011).

As there are known differences in the cause and prevalence of UI between men after TURP and after radical prostatectomy, these groups of men should continue to be studied separately. Prevention trials in all men having surgery should be evaluated separately from

treatment trials of men who all have urinary incontinence after surgery.

Most of the trials included in this review used very different protocols, of intervention type, timing and intensity. In order to determine the effects of specific protocols and modalities, large adequately powered trials using common protocols and common standardised outcome measures are needed. Replication studies using similar protocols in different populations would also assist in identifying the populations in which specific conservative management approaches may be effective.

Definitions and measurement of outcomes varied in the included trials. Future trials must attempt to use broadly accepted validated outcome measures, such as those of the International Continence Society (ICS). The primary outcome measure should be the participant's self-reported UI or its effects on his quality of life. Other objective measures such as the pad test or urinary diaries can be used to determine if continence has been achieved. Researchers must also focus on either the 1 hour or 24 hour pad test, as the results of these two measurements are not equivalent.

Lastly, authors should be encouraged to ensure appropriate measures are taken to avoid the risk of bias from selection, performance, detection and attrition bias, in particular adequate sequence generation and secure concealment of allocation for randomisation, and blinding of outcome measurement, and to report these adequately using the guidelines of the CONSORT statement.

ACKNOWLEDGEMENTS

Katherine Moore was supported by a postdoctoral fellowship from the Leverhulme Trust, London, England in 1998 thereby allowing the time for the original review (first published 1998). Authors of nine trials (Burgio 2006; Dubbelman 2004; Filocamo 2005; Floratos 2002; Glazener RP 2011; Glazener TURP 2011; Hoffman 2005, Joseph 2000; Wille 2003) generously shared further data so that their trials could be included in this review. We thank Neil Scott for the translation of a German language article (arranged by Sheila Wallace) as well as Matthew Tripp for another. Peter Herbison provided expertise in the area of statistics and assisted in interpreting data provided by authors.

For the 2014 update of the review, the review authors would like to acknowledge Ying Hao for the translation of two Chinese language articles. Authors of five trials (Dijkstra-Eshuis 2013; Fode 2014; Geraerts 2013; Hou 2013; Park 2012; Tienforti 2012) kindly provided further data. The review authors would also like to acknowledge Katherine Moore for her contribution to the previous versions of the review.

REFERENCES

References to studies included in this review

Ahmed 2012 *{published data only}*

Ahmed MT, Mohammed AH, Amansour A. Effect of pelvic floor electrical stimulation and biofeedback on the recovery of urinary continence after radical prostatectomy. *Turkiye Fiziksel Tıp ve Rehabilitasyon Dergisi* 2012;**58**(3):170–6. [: sr-incont47262]

Omar M, Mohammed AH. Effect of pelvic floor exercises, electrical stimulation and biofeedback on urinary incontinence after radical prostatectomy: single blind randomized clinical trial. ANZCTR (<http://www.anzctr.org.au/ACTRN12610000975099.aspx>) 2010.

Bales 2000 *{published data only}*

Bales G, Gerber G, Minor T, Mhoon D, McFarland J, Hyung L, et al. Effect of preoperative biofeedback/pelvic floor training on continence in men undergoing radical prostatectomy. *Urology* 2000;**56**:627–30. [: SRINCONT11831]

Burgio 2006 *{published and unpublished data}*

* Burgio KL, Goode P, Urban D, Umlauf M, Locher J, Bueschen A, Redden D. Preoperative biofeedback-assisted behavioural training to reduce post-prostatectomy incontinence: A randomized controlled trial. *Journal of Urology* 2006;**175**(1):196–201. [: SRINCONT21637]

Burgio KL, Goode P, Urban D, Umlauf M, Locher J, Bueschen A, Redden D. Preoperative biofeedback-assisted behavioural training to reduce post-prostatectomy incontinence: A randomized controlled trial [abstract]. *Neurourology and Urodynamics* 2005;**24**(5/6):477. [: SRINCONT20970]

Centemero 2009 *{published data only}*

Centemero A, Rigatti L, Andrea L, Gallina A, Lughezzani G, Montorsi F, et al. Effectiveness of pre-operative pelvic floor muscle training for post-prostatectomy early incontinence recovery (Abstract number 1642). *Journal of Urology* 2009; **181**(4 (Suppl 1)):591. [: SR-INCONT34592]

Centemero A, Rigatti L, Giraudo D, Lazzeri M, Lughezzani G, Zugna D, et al. Preoperative pelvic floor muscle exercise for early continence after radical prostatectomy: a randomised controlled study. *European Urology* 2010;**57**(6): 1039–43. [: SR-INCONT40316]

Dijkstra-Eshuis 2013 *{published data only}*

Dijkstra-Eshuis J, Splinter R, Zonneveld W, Putter H, Van Den Bos T, Bevers R, et al. Effect of preoperative pelvic floor muscle therapy with biofeedback versus standard care on stress urinary incontinence and quality of life in men undergoing laparoscopic radical prostatectomy (Abstract number 137). *Neurourology and Urodynamics* 2013;**32**(6): 712–3. [: sr-incont49210]

Dijkstra-Eshuis J, van den Bos TW, Splinter R, Bevers RF, Zonneveld WC, Putter H, et al. Effect of preoperative pelvic floor muscle therapy with biofeedback versus standard care on stress urinary incontinence and quality of life in men undergoing laparoscopic radical prostatectomy:

A randomised control trial [epub ahead of print published online 19 November 2013]. *Neurourology and Urodynamics* 2013. [: sr-incont49547]

Voorham-Van Der Zalm P, Dijkstra-Eshuis J, Splinter R, Putter H, Bevers RFM, Pelger RCM. Effect of preoperative pelvic floor muscle therapy versus standard care on stress urinary incontinence in men undergoing radical laparoscopic prostatectomy (Abstract number 1365). *Journal of Urology* 2013;**189**(4 Suppl 1):e558–9. [: sr-incont50002]

Voorham-Van Der Zalm PJ, Stoetman AM, Putter H, Bevers RFM, Pelger RCM. Effect of preoperative pelvic floor physiotherapy versus standard care on incontinence in men undergoing radical laparoscopic prostatectomy: an ongoing study (Abstract number 590). Proceedings of the Joint Meeting of the International Continence Society (ICS) and the International Urogynecological Association, 2010 Aug 23–27, Toronto, Canada. 2010. [: SR-INCONT40184]

Dubbelman 2004 *{published and unpublished data}*

Dubbelman Y, Groen J, Wildhagen M, Rikken B, Bosch R. The recovery of urinary continence after radical retropubic prostatectomy: a randomized trial comparing the effect of physiotherapist-guided pelvic floor muscle exercises with guidance by an instruction folder only. *BJU International* 2010;**106**(4):515–22. [: SR-INCONT40056]

Dubbelman Y, Groen J, Wildhagen M, Rikken B, Bosch R. UPDATE Quantification of changes in detrusor function and pressure-flow parameters after radical prostatectomy: relation to postoperative continence status and the impact of intensity of pelvic floor muscle exercises. *Neurourology and Urodynamics* 2012;**31**(5):637–41. [: srincont45959]

Dubbelman YD, Groen J, Bosch R. Post prostatectomy incontinence: Significance of the pre-operative urethral pressure profile and the role of physiotherapy [abstract]. *Neurourology and Urodynamics* 2004;**23**(5-6):471. [: SRINCONT19009]

Dubbelman YD, Groen J, Wildhagen MF, Rikken B, Bosch JL. UPDATE Urodynamic quantification of decrease in sphincter function after radical prostatectomy: relation to postoperative continence status and the effect of intensive pelvic floor muscle exercises. *Neurourology and Urodynamics* 2012;**31**(5):646–51. [: srincont45958]

Fader 2013 *{published data only}*

Fader M, Macaulay M, Broadbridge J, Cottenden A, Birch B, Moore KN. A trial of devices for the management of urinary incontinence following treatment for prostate cancer (Abstract number 264). *Neurourology and Urodynamics* 2013;**32**(6):891–2. [: sr-incont49194]

Filocamo 2005 *{published and unpublished data}*

Del Popolo G, Filocamo MT, Li Marzi V, Cecconi F, Marzocco M, Tosto A, et al. Effectiveness of early pelvic floor rehabilitation treatment for post-prostatectomy incontinence (Abstract number 610). Proceedings of the International Continence Society (ICS), 35th Annual

- Meeting, 2005 Aug 28-Sep 2, Montreal, Canada 2005. [SR-INCONT21063]
- * Filocamo MT, Li Marzi V, Del Popolo G, Cecconi F, Marzocco M, Tosto A, et al. Effectiveness of early pelvic floor rehabilitation treatment for post-prostatectomy incontinence. *European Urology* 2005;**48**(5):734–8. [SRINCONT21252]
- Floratos 2002** {published data only}
 Floratos DL, Sonke GS, Rapidou CA, Alivizatos GJ, Deliveliotis C, Constantinides CA, et al. Biofeedback versus verbal feedback as learning tools for pelvic muscle exercises in the early management of urinary incontinence after radical prostatectomy. *British Journal of Urology International* 2002;**89**(7):714–9. [SRINCONT15333]
- Fode 2014** {published data only}
 Fode M, Borre M, Ohl DA, Lichtbach J, Sonksen J. Penile vibratory stimulation in the recovery of urinary continence and erectile function after nerve-sparing radical prostatectomy: a randomized, controlled trial [epub ahead of print] [first published online 22 Jan 2014]. *BJU International* 2014. [NCT01067261; sr-incont50324]
 Sonksen JR. Transcutaneous Mechanical Nerve Stimulation (TMNS) by Vibration in the Preservation and Restoration of Urinary Continence and Erectile Function and in the Treatment of Erectile Dysfunction and Urinary Incontinence in Conjunction With Nerve Sparing Radical Prostatectomy. <http://clinicaltrials.gov/show/NCT01067261> 2010. [NCT01067261; sr-incont47825]
- Franke 1998** {published data only}
 * Franke JJ, Gilbert WB, Grier J, Koch MO, Shyr Y, Smith JA Jr. Early post-prostatectomy pelvic floor biofeedback. *Journal of Urology* 2000;**163**(1):191–3. [SRINCONT9180]
 Franke JJ, Grier J, Koch MO, Smith JA. Biofeedback-enhanced pelvic floor exercises in the early post prostatectomy period. *Journal of Urology* 1998;**159** Suppl 5:37. [SRINCONT5734]
- Geraerts 2013** {published data only}
 Geraerts I, van Poppel H, Devoogdt N, Joniau S, van Cleynenbreugel B, De Groef A, et al. Influence of preoperative and postoperative pelvic floor muscle training (PFMT) compared with postoperative PFMT on urinary incontinence after radical prostatectomy: a randomized controlled trial. *European Urology* 2013;**64**(5):766–72. [NTR1953; sr-incont49488]
- Ghanem 2013** {published data only}
 Ghanem A, Khallaf M, Assem A, Hassan A. Does preoperative pelvic floor muscle exercise improve post prostatectomy urinary incontinence? (Abstract number 695). Proceedings of the 43rd Annual Meeting of the International Continence Society (ICS), 2013 Aug 26–30, Barcelona, Spain 2013. [sr-incont49728]
- Glazener RP 2011** {published data only}
 Dorey G, Glazener C, Buckley B, Cochran C, Moore K. Developing a pelvic floor muscle training regimen for use in a trial intervention. *Physiotherapy* 2009;**95**(3):199–209. [SR-INCONT32096]
 Glazener C, Boachie C, Buckley B, Cochran C, Dorey G, Grant A, et al. A randomized controlled trial of conservative treatment (pelvic floor muscle training and bladder training) for urinary incontinence in men after prostate surgery (MAPS) (Abstract number 200). *Neurourology and Urodynamics* 2010;**29**(6):1093–4. [SR-INCONT40156]
 * Glazener C, Boachie C, Buckley B, Cochran C, Dorey G, Grant A, et al. Conservative treatment for urinary incontinence in Men After Prostate Surgery (MAPS): two parallel randomised controlled trials. *Health Technology Assessment (Winchester, England)* 2011;**15**(24):1–290. [SR-INCONT41754]
 Glazener C, Boachie C, Buckley B, Cochran C, Dorey G, Grant A, et al. Urinary incontinence in men after formal one-to-one pelvic-floor muscle training following radical prostatectomy or transurethral resection of the prostate (MAPS): two parallel randomised controlled trials. *Lancet* 2011;**378**(9788):328–37. [SR-INCONT41752]
 Glazener CMA. MAPS (Men After Prostate Surgery): Conservative Treatment for Men With Urinary Incontinence After Prostate Surgery; Multicentre Randomised Controlled Trial of Pelvic Floor Muscle Training and Biofeedback [MAPS]. <http://clinicaltrials.gov/show/NCT00632138> 2005. [NCT00632138; sr-incont47844]
 Hagen S, Glazener C, Cochran C, Campbell L. Continence care for men having prostate surgery: advice and care before and after radical prostatectomy and transurethral resection of prostate (Abstract number 96). *Neurourology and Urodynamics* 2009;**28**(7):690–1. [SRINCONT34583]
 Update Buckley B, Lapitan MCM, Glazener C. The effect of urinary incontinence on health utility and health related quality of life in men following prostate surgery (Abstract number 542). Proceedings of the 41st Annual Meeting of the International Continence Society (ICS), 2011 Aug 29 to Sept 2, Glasgow, Scotland 2011. [ISRCTN87696430; MAPS; srincont47758]
 Update Buckley BS, Lapitan MC, Glazener CM, MAPS Trial Group. The effect of urinary incontinence on health utility and health-related quality of life in men following prostate surgery. *Neurourology and Urodynamics* 2012;**31**(4):465–9. [ISRCTN87696430; MAPS; NCT00632138; srincont44658]
 Update Glazener C, Boachie C, Hagen S, Kilonzo M, Cochran C, Buckley B, et al. Clinical outcomes two years after a randomised controlled trial of pelvic floor muscle training after radical prostatectomy or TURP: men after prostate surgery trial (MAPS) (Abstract number 254). *Neurourology and Urodynamics* 2011;**30**(6):1150–1. [MAPS; srincont:42203]
- Glazener TURP 2011** {published data only}
 Dorey G, Glazener C, Buckley B, Cochran C, Moore K. Developing a pelvic floor muscle training regimen for use in a trial intervention. *Physiotherapy* 2009;**95**(3):199–209. Glazener C, Boachie C, Buckley B, Cochran C, Dorey G, Grant A, et al. A randomized controlled trial of conservative

treatment (pelvic floor muscle training and bladder training) for urinary incontinence in men after prostate surgery (MAPS) (Abstract number 200). *Neurourology and Urodynamics* 2010;**29**(6):1093–4.

* Glazener C, Boachie C, Buckley B, Cochran C, Dorey G, Grant A, et al. Conservative treatment for urinary incontinence in Men After Prostate Surgery (MAPS): two parallel randomised controlled trials. *Health Technology Assessment (Winchester, England)* 2011;**15**(24):1–290.

Glazener C, Boachie C, Buckley B, Cochran C, Dorey G, Grant A, et al. Urinary incontinence in men after formal one-to-one pelvic-floor muscle training following radical prostatectomy or transurethral resection of the prostate (MAPS): two parallel randomised controlled trials. *Lancet* 2011;**378**(9788):328–37.

Hagen S, Glazener C, Cochran C, Campbell L. Continence care for men having prostate surgery: advice and care before and after radical prostatectomy and transurethral resection of prostate (Abstract number 96). *Neurourology and Urodynamics* 2009;**28**(7):690–1.

Update Buckley B, Lapitan MCM, Glazener C. The effect of urinary incontinence on health utility and health related quality of life in men following prostate surgery (Abstract number 542). Proceedings of the 41st Annual Meeting of the International Continence Society (ICS), 2011 Aug 29 to Sept 2, Glasgow, Scotland 2011. [: ISRCTN87696430; : MAPS; : srincont47758]

Update Buckley BS, Lapitan MC, Glazener CM, MAPS Trial Group. The effect of urinary incontinence on health utility and health-related quality of life in men following prostate surgery. *Neurourology and Urodynamics* 2012;**31**(4):465–9. [: ISRCTN87696430; : MAPS; : NCT00632138; : srincont44658]

Update Glazener C, Boachie C, Hagen S, Kilonzo M, Cochran C, Buckley B, et al. Clinical outcomes two years after a randomised controlled trial of pelvic floor muscle training after radical prostatectomy or TURP: men after prostate surgery trial (MAPS) (Abstract number 254). *Neurourology and Urodynamics* 2011;**30**(6):1150–1. [: MAPS; : srincont:42203]

Goode 2009 {published data only}

Goode P, Burgio K, Johnson T, Roth D, Clay O, Burkhardt J, et al. Behavioral therapy with or without biofeedback and pelvic floor electrical stimulation for persistent post-prostatectomy incontinence - a randomized controlled trial (Abstract number 87). *Neurourology and Urodynamics* 2009;**28**(7):681–2. [: SR-INCONT34582]

Goode PS. Conservative Treatment of Postprostatectomy Incontinence. <http://clinicaltrials.gov/show/NCT00212264> 2003. [: NCT00212264; : sr-incont47864]

Goode PS, Burgio KL, Johnson TM, Clay OJ, Roth DL, Markland AD, et al. Behavioral therapy with or without biofeedback and pelvic floor electrical stimulation for persistent postprostatectomy incontinence: a randomized controlled trial. *JAMA* 2011;**305**(2):151–9. [: SR-INCONT40806]

Hoffman 2005 {published and unpublished data}

Hoffmann W, Liedke S, Dombo O, Otto U. Electrical stimulation to treat postoperative incontinence: Therapeutic benefit in regard to quality of life [Die Electrostimulation in der Therapie der postoperativen Harninkontinenz. Therapeutischer Nutzen unter Berücksichtigung der Lebensqualität]. *Urologe* 2004;**44**:33–40. [: SRINCONT20402]

Hou 2013 {published data only}

Hou CP, Chen TY, Chang CC, Lin YH, Chang PL, Chen CL, et al. Use of the SF-36 quality of life scale to assess the effect of pelvic floor muscle exercise on aging males who received transurethral prostate surgery. *Clinical Interventions In Aging* 2013;**8**:667–73. [: sr-incont48064]

Joseph 2000 {published and unpublished data}

Joseph AC, Chang MK. Comparison of behavior therapy methods for urinary incontinence following prostate surgery: a pilot study. *Urologic Nursing* 2000;**20**(3):203–4. [: SRINCONT15334]

Koo 2009 {published data only}

Kim YH, Hwang EG, Shin JH, Kim YW, Lim JS, Na YG, Song KH, Sul CK. Effect of extracorporeal magnetic innervation (ExMI) pelvic floor therapy for urinary incontinence after radical prostatectomy. *Urology* 2009;**74** Suppl 4A:S227. [: SR-INCONT42741]

Koo D, So SM, Lim JS. Effect of Extracorporeal Magnetic Innervation (ExMI) pelvic floor therapy on urinary incontinence after radical prostatectomy [Korean]. *Korean Journal of Urology* 2009;**50**(1):23–7. [: SR-INCONT34595]

Laurienzo 2013 {published data only}

Laurienzo CE, Sacomani CA, Rodrigues TR, Zequi Sde C, Guimaraes GC, Lopes A. Results of preoperative electrical stimulation of pelvic floor muscles in the continence status following radical retropubic prostatectomy. *International Brazilian Journal of Urology* 2013;**39**(2):182–8. [: sr-incont48139]

Liu 2008 {published data only}

Liu F. [Extracorporeal magnetic innervation in the treatment of urinary incontinence after radical prostatectomy]. *Journal of Clinical Rehabilitative Tissue Engineering Research* 2008;**12**(17):3289–92. [: SRINCONT34489]

Manassero 2007 {published data only}

Manassero F, Traversi C, Ales V, Pistolesi D, Panicucci E, Valent F, et al. Contribution of early intensive prolonged pelvic floor exercises on urinary continence recovery after bladder neck-sparing radical prostatectomy: results of a prospective controlled randomized trial. *Neurourology and Urodynamics* 2007;**26**(7):985–9. [: SRINCONT23915]

Marchiori 2010 {published data only}

Marchiori D, Bertaccini A, Manferrari F, Ferri C, Martorana G. Pelvic floor rehabilitation for continence recovery after radical prostatectomy: role of a personal training re-educational program. *Anticancer Research* 2010;**30**(2):553–6.

Mariotti 2009 *{published data only}*

Mariotti G, Sciarra A, Gentilucci A, Salciccia S, Alfarone A, Pierro GD, et al. Early recovery of urinary continence after radical prostatectomy using early pelvic floor electrical stimulation and biofeedback associated treatment. *Journal of Urology* 2009;**181**(4):1788–93. [SRINCONT31079]
Sciarra A, Salciccia S, Gentilucci A, Alfarone A, Di Pierro GB, Mariotti G, et al. Early recovery of urinary continence after radical prostatectomy using early pelvic floor electric stimulation and biofeedback associated treatment. *Journal of Urology* 2009;**181**(4 Suppl 1):680. [SRINCONT42739]
Sciarra A, Salciccia S, Gentilucci A, Alfarone A, Mariotti G, Cattarino S, et al. Early recovery of urinary continence after radical prostatectomy using early pelvic floor electric stimulation and biofeedback associated treatment (Abstract number 412). *European Urology Supplements* 2009;**8**(4):223. [SR-INCONT42738]

Martini 2011 *{published data only}*

Martini M, Bernardini S, Blanc E, Piretta K, Tappero R. Relationship between integrity of pelvic floor function and recovery of continence after laparoscopic prostatectomy and effects of preventive pelvic floor training in males with pelvic floor weakness (Abstract number 14). *Neurourology and Urodynamics* 2011;**30** Suppl 1:11–2. [sr-incont47398]

Mathewson-Chapman 97 *{published data only}*

Mathewson-Chapman M. *The effect of pelvic muscle exercises with biofeedback for urinary incontinence post-prostatectomy*. [Unpublished PhD dissertation]. Gainesville: University of Florida, 1995. [SRINCONT11221]
* Mathewson-Chapman M. Pelvic muscle exercise/biofeedback for urinary incontinence after prostatectomy: an education program. *Journal of Cancer Education* 1997;**12**(4):218–23. [SRINCONT5381]

Moore 1999 *{published and unpublished data}*

Moore KN. *The effect of urinary incontinence on the quality of life following radical prostatectomy* [Unpublished PhD Thesis]. Edmonton: University of Alberta, 1997. [SRINCONT8006]
Moore KN, Griffiths DJ, Hughton A. A randomised controlled trial of pelvic muscle exercises or pelvic muscle exercises plus electrical stimulation for post radical prostatectomy urinary incontinence [abstract]. *Neurourology and Urodynamics* 1998;**17**:424–6. [SRINCONT5677]
* Moore KN, Griffiths DJ, Hughton A. Urinary incontinence after post radical prostatectomy: A randomised controlled trial comparing pelvic muscle exercises with pelvic muscle exercises plus electrical stimulation. *British Journal of Urology International* 1999;**83**:57–65. [SRINCONT5730]

Moore 2004 *{published data only}*

Moore KN, Schieman S, Ackerman T, Drus H, Metcalfe JB, Voaklander DC. Assessing the comfort, safety and patient satisfaction with three commonly used penile compression devices. *Urology* 2004;**63**(1):150–4. [SRINCONT19156]

Moore 2008 *{published and unpublished data}*

Moore KN. The effectiveness of biofeedback assisted pelvic floor muscle exercises in the treatment of incontinence post radical prostatectomy. [Personal Communication] (as supplied 11 May 2006). Data on file.
Moore KN, Valiquette L, Chetner MP, Byrniak S, Herbison GP. Return to continence after radical retropubic prostatectomy: A randomized trial of verbal and written instructions versus therapist-directed pelvic floor muscle therapy. *Urology* 2008;**72**(6):1280–6. [SR-INCONT26907]

Morihiro 2011 *{published data only}*

Morihiro N, Masatsugu I, Shinji K, Kenichi T, Kazumasa M, Shiro B. Effectiveness of sacral surface therapeutic electrical stimulation (SSTES) on early recovery of urinary incontinence after laparoscopic radical prostatectomy: a prospective study (Abstract number 64). *Neurourology and Urodynamics* 2011;**30**(6):889–90. [SR-INCONT42173]

Nowak 2007 *{published data only}*

Nowak M, Jordan M, Haberl S, Herwig R, Kuehhas F, Brausi M, et al. Prospective study of extracorporeal magnetic innervation pelvic floor therapy (EXMI) versus standard pelvic floor training following radical prostatectomy: Impact on timing and magnitude of recovery of continence (Abstract number 482). *European Urology Supplements* 2007;**6**(2):143. [SRINCONT34792]

Opsomer 1994 *{published data only}*

Opsomer RJ, Castille Y, Abi Aad AS, van Cangh PJ. Urinary incontinence after radical prostatectomy: Is professional pelvic floor training necessary?. *Neurourology and Urodynamics* 1994;**13**(4):382–4. [SRINCONT2687]

Overgard 2008 *{published data only}*

Morkved S. Urinary Incontinence After Radical Prostatectomy. - Effect of Pelvic Floor Muscle Training. A Randomised Controlled Trial. <http://clinicaltrials.gov/show/NCT00239824> 2005. [NCT00239824; sr-incont47830]
Morkved S, Overgard M, Lydersen S, Angelsen A. Does pelvic floor muscle training with follow up instructions by a physiotherapist reduce urinary incontinence after radical prostatectomy? - A randomised controlled trial (Abstract number 15). *Neurourology and Urodynamics* 2008;**27**(7):587–8. [SR-INCONT31841]
Overgard M, Angelsen A, Lydersen S, Morkved S. Does physiotherapist-guided pelvic floor muscle training reduce urinary incontinence after radical prostatectomy?: A randomised controlled trial. *European Urology* 2008;**54**:438–48. [SR-INCONT26906]
Update Angelsen A, Nilssen S, Overgard M, Lydersen S, Morkved S. Does physiotherapist-guided pelvic floor muscle training increase the quality of life in patients after radical prostatectomy? A randomized clinical study (Abstract number 733). Proceedings of the 42nd Annual Meeting of the International Continence (ICS), 2012 Oct 15 to 19, Beijing, China 2012. [NCT00239824; srincont47938]
Update Nilssen SR, Morkved S, Overgard M, Lydersen S, Angelsen A. Does physiotherapist-guided pelvic floor

- muscle training increase the quality of life in patients after radical prostatectomy? A randomized clinical study. *Scandinavian Journal of Urology and Nephrology* 2012;**46**(6): 397–404. [: NCT00239824; : SR-INCONT46190]
- Parekh 2003** *{published data only}*
Parekh AR, Feng Mi, Kirages D, Bremner H, Kaswick J, Aboseif S. The role of pelvic floor exercises on post-prostatectomy incontinence. *Journal of Urology* 2003;**170**: 130–3. [: SRINCONT16004]
- Park 2012** *{published data only}*
Park S-W, Park C-S, Kim T-N, Lee W, Nam J-K. The effects of a 12-week's combined exercise intervention on physical function and mental health after radical prostatectomy in elderly patients with prostate cancer: a prospective, randomised controlled study (Abstract number 1309). *Journal of Urology* 2011;**185**(4S):e524. [: SR-INCONT42511]
Park SW, Kim TN, Nam JK, Ha HK, Shin DG, Lee W, et al. Recovery of overall exercise ability, quality of life, and continence after 12-week combined exercise intervention in elderly patients who underwent radical prostatectomy: a randomized controlled study. *Urology* 2012;**80**(2):299–306. [: SR-INCONT45132]
- Perissinotto 2008** *{published data only}*
Perissinotto MCR, D'Ancona CAL, Campos RM, Lucio AC, Silva JrW. Physiotherapeutic for treatment of post radical prostatectomy urinary incontinence (Abstract number 265). Proceedings of the International Continence Society (ICS), 38th Annual Meeting, 2008 Oct 20-24, Cairo, Egypt. 2008. [: SRINCONT31843]
- Porru 2001** *{published data only}*
Porru D, Campus G, Caria A, Madeddu, Cucchi A, Rovereto B, et al. Impact of early pelvic floor rehabilitation after transurethral resection of the prostate. *Neurourology and Urodynamics* 2001;**20**:53–9. [: SRINCONT11849]
- Ribeiro 2008** *{published data only}*
Ribeiro LH, Prota C, Gomes CM, de Bessa J Jr, Boldarine MP, Dall'Oglio MF, et al. Long-term effect of early postoperative pelvic floor biofeedback on continence in men undergoing radical prostatectomy: a prospective, randomized, controlled trial. *Journal of Urology* 2010;**184**(3):1034–9. [: SR-INCONT40040]
Ribeiro LS, Prota C, Gomes CM, Dall'Oglio MF, Bruschini H, Srougi M. Effect of early postoperative pelvic-floor biofeedback on continence in men undergoing radical prostatectomy: A randomized, controlled trial (Abstract number 1412). *Journal of Urology* 2008;**179**(4 Suppl S): 483. [: SRINCONT26921]
Ribiero LS, Prota C, Gomes CM, Boldarine MP, Nakano E, Dall'Oglio M, et al. Early pelvic-floor biofeedback training promotes long-term improvement of urinary continence after radical prostatectomy (Abstract number 1882) [:]. *Journal of Urology* 2009;**181**(4 Suppl):680. [: SR-INCONT42736]
- Robinson 2008** *{published data only}*
Robinson JP, Bradway CW, Nuamah I, Pickett M, McCorkle R. Systematic pelvic floor training for lower urinary tract symptoms post-prostatectomy: a randomized clinical trial. *International Journal of Urological Nursing* 2008;**2**(1):3–13. [: SRINCONT34593]
- Robinson 2009** *{published data only}*
Robinson J, Weiss R, Avi-Itzhak T, McCorkle R. Pilot-testing of a theory-based pelvic floor training intervention for radical prostatectomy patients (Abstract number 88). *Neurourology and Urodynamics* 2009;**28**(7):682–3. [: SRINCONT34587]
- Seleme 2008** *{published data only}*
Seleme M, Ribeiro V, Moreno A, Berghmans B, Bendhack M. Efficacy of physiotherapy after radical prostatectomy (Abstract number 256). Proceedings of the International Continence Society (ICS), 38th Annual Meeting, 2008 Oct 20-24, Cairo, Egypt. 2008. [: SRINCONT31842]
- Tibaek 2007** *{published data only}*
Tibaek S, Klarskov P, Hansen BL, Thomsen H, Andresen H, Jensen CS, et al. Pelvic floor muscle training before transurethral resection of the prostate: A randomized, controlled, blinded study. *Scandinavian Journal of Urology and Nephrology* 2007;**41**(4):329–34. [: SRINCONT23879]
Tibaek S, Klarskov P, Lund Hanzen B, Thomsen H, Andresen H, Schmidt Jensen C, et al. Pelvic floor muscle training before transurethral resection of the prostate (Abstract number 31).. *Neurourology and Urodynamics* 2006;**25**(6):546–7. [: SR-INCONT26614]
- Tienforti 2012** *{published data only}*
Sacco E, Tienforti D, D'Addressi A, Racioppi M, Gulino G, Pinto F, et al. Efficacy of a supervised, affordable program of perioperative pelvic floor muscle training in improving the recovery of continence after radical prostatectomy: a randomized controlled trial (Abstract number 138). *Neurourology and Urodynamics* 2011;**30**(6):995–7. [: SR-INCONT42188]
Sacco E, Tienforti D, Marangi F, D'Addressi A, Racioppi M, Gulino G, et al. Efficacy of a supervised low-intensity regimen of perioperative pelvic floor muscle training in reducing postprostatectomy urinary incontinence: A randomized controlled trial (Abstract number 286). *European Urology Supplements* 2012;**11**(1):e286. [: sr-incont47271]
* Tienforti D, Sacco E, Marangi F, D'Addressi A, Racioppi M, Gulino G, et al. Efficacy of an assisted low-intensity programme of perioperative pelvic floor muscle training in improving the recovery of continence after radical prostatectomy: a randomized controlled trial. *BJU International* 2012;**110**(7):1004–10. [: SR-INCONT45339]
- Tobia 2008** *{published data only}*
Tobia I, Gonzalez MS, Martinez P, Tejerizo JC, Gueglio G, Damia O, et al. [Randomized study on urinary continence after radical prostatectomy with previous kinesic perineal

- physiotherapy]. [Spanish]. *Archivos Espanoles de Urologia* 2008;**61**(7):793–8. [: SRINCONT27688]
- van Kampen 1998** *{unpublished data only}*
 Van Kampen M, De Weerd W, Van Poppel H, Baert L. Urinary incontinence after radical prostatectomy can be treated by pelvic floor re-education and predicted by measuring urine loss at catheter withdrawal: a controlled study. Proceedings of the International Continence Society (ICS), 29th Annual Meeting; 1999 Aug 22-26; Denver, Colorado. 1999;246–7. [: SR-INCONT9919]
 * Van Kampen M, De Weerd W, Van Poppel H, De Ridder D, Feys H, Baert L. Effect of pelvic floor re-education on duration and degree of incontinence after radical prostatectomy: a randomised controlled trial. *Lancet* 2000;**355**(9198):98–102. [: SRINCONT9012]
 Van Kampen M, De Weerd W, Van Poppel H, De Ridder D, Feys H, Baert, L. The efficacy of physiotherapy on the degree and the duration of incontinence after radical prostatectomy: a randomised controlled study [abstract]. *Neurourology and Urodynamics* 1998;**17**(4):49–50. [: SRINCONT5681]
 van Kampen M, De Weerd W, Van Poppel H, De Ridder D, Feys H, Baert L. *The efficacy of physiotherapy on the degree and the duration of incontinence after radical prostatectomy: a randomised controlled study*. [Unpublished doctoral thesis]. Belgium: University of Leuven, 1998. [: SRINCONT5732]
- Wille 2003** *{published and unpublished data}*
 * Wille S, Sobottka A, Heidenreich A, Hofmann R. Pelvic floor exercises, electrical stimulation and biofeedback after radical prostatectomy: Results of a prospective randomized trial. *Journal of Urology* 2003;**170**(2 Part 1):490–3. [: SRINCONT16931]
 Wille S, Sobottka A, Olbert P, Heidenreich A, Hofmann R. Impact of electrical stimulation or biofeedback on quality of life after radical prostatectomy: Results of a prospective randomized trial (Abstract number 167). *Journal of Urology* 2004;**171**(4 Suppl):44. [: SRINCONT27408]
- Yamanishi 2006** *{published data only}*
 Yamanishi K, Mizuno T, Sakakibara R, Uchiyama T, Ito Y, Yamamoto T, et al. A randomized, placebo-controlled, double-blind study of electrical stimulation with pelvic floor muscle training for the treatment of urinary incontinence after radical prostatectomy (Abstract number 30). *Neurourology and Urodynamics* 2006;**25**(6):545–6. [: SRINCONT26613]
 Yamanishi T, Mizuno T, Watanabe M, Honda M, Yoshida K-I. Randomized, placebo controlled study of electrical stimulation with pelvic floor muscle training for severe urinary incontinence after radical prostatectomy. *Journal of Urology* 2010;**184**(5):2007–12. [: SR-INCONT40344]
- Yokoyama 2004** *{published data only}*
 Yokoyama T, Nishiguchi J, Watanabe T, Nose H, Nozaki K, Fujita O, Inoue M, et al. Comparative study of effects of extracorporeal magnetic innervation versus electrical stimulation for urinary incontinence after radical prostatectomy. *Urology* 2004;**63**(2):264–7. [: SRINCONT17116]
- Zhang 2007** *{published data only}*
 Zhang AY, Galanek J, Strauss GJ, Siminoff LA. What it would take for men to attend and benefit from support groups after prostatectomy for prostate cancer: a problem-solving approach. *Journal of Psychosocial Oncology* 2008;**26**(3):97–112. [: SRINCONT29254]
 Zhang AY, Strauss GJ, Siminoff LA. Effects of combined pelvic floor muscle exercise and a support group on urinary incontinence and quality of life of postprostatectomy patients. *Oncology Nursing Forum Online* 2007;**34**(1):47–53. [: SRINCONT31506]
 Zhang AY, Strauss GJ, Siminoff LA. Intervention of urinary incontinence and quality of life outcome in prostate cancer patients. *Journal of Psychosocial Oncology* 2006;**24**(2):17–30. [: SRINCONT22147]

References to studies excluded from this review

- Bennett 1997** *{published data only}*
 Bennett JK, Foote JE, Green BG, Killorin EW, Martin SH. Effectiveness of biofeedback/electrostimulation in the treatment of post prostatectomy urinary incontinence [abstract]. Proceedings of the Urodynamics Society Annual Meeting. 1997.
- Bocker 2002** *{published data only}*
 Bocker B, Smolenski UC. [Physikalische therapie der beckenbodeninsuffizienz– methodenvergleich]. *Journal fur Urologie und Urognakologie* 2002;**2**:20–7.
- Burkert 2011** *{published data only}*
 Burkert S, Scholz U, Gralla O, Roigas J, Knoll N. Dyadic planning of health-behavior change after prostatectomy: a randomized-controlled planning intervention. *Social Science & Medicine* 2011;**73**(5):783–92. [: srincont46861]
- Ceresoli 2002** *{unpublished data only}*
 Ceresoli A, Kartalas Goumas J, Colombo F, Barbetti E, Dell'Aglio F, Bonacina P, et al. Daily transcutaneous electrical nerve stimulation (DTENS) after radical perineal prostatectomy: A free cost effective biofeedback technique in the treatment of post operative urinary incontinence (abstract). Proceedings of the 32nd Annual Meeting of the International Continence Society; 2002 Aug 28-30; Heidelberg, Germany. 2002.
- Chang 1998** *{published data only}*
 Chang PL, Tsai LH, Huang ST, Hsieh ML, Tsui KH. The early effect of pelvic floor muscle exercise after transurethral prostatectomy. *Journal of Urology* 1998;**160**(2):402–5.
- Cornel 2005** *{published data only}*
 Cornel EB, de Wit R, Witjes JA. Evaluation of early pelvic floor physiotherapy on the duration and degree of urinary incontinence after radical retropubic prostatectomy in a non-teaching hospital. *World Journal of Urology* 2005;**23**:353–5.
- Cornu 2011** *{published data only}*
 Cornu JN, Merlet B, Ciofu C, Mouly S, Peyrat L, Sebe P, et al. Duloxetine for mild to moderate postprostatectomy

- incontinence: preliminary results of a randomised, placebo-controlled trial. *European Urology* 2011;**59**(1):148–54. [SR-INCONT41370]
- Crevenna 2003** *{published data only}*
Crevenna R, Zoch C, Kellani M, Quittan M, Fialka-Moser V. Implementation of a physical rehabilitation group for post-prostatectomy urinary incontinence patients and its effects on quality of life. *Physikalische Medizin Rehabilitationsmedizin Kurortmedizin* 2003;**13**(6):339–44.
- Dieperink 2013** *{published data only}*
Dieperink KB, Johansen C, Hansen S, Wagner L, Andersen KK, Minet LR, et al. The effects of multidisciplinary rehabilitation: RePCa-a randomised study among primary prostate cancer patients. *British Journal of Cancer* 2013;**109**(12):3005–13.
- Eren 2013** *{published data only}*
Alan C, Ersay AR, Eren AE, Altintas R, Kocoglu H, Basturk G. Efficacy of early duloxetine therapy in urinary incontinence occurred after radical prostatectomy (Abstract number 704). Proceedings of the 43rd Annual Meeting of the International Continence Society (ICS), 2013 Aug 26–30, Barcelona, Spain 2013. [SR-INCONT49727]
Eren AE, Alan C, Basturk G. Efficacy of early duloxetine therapy in urinary incontinence occurred after radical prostatectomy (Abstract number 25226). *BJU International* 2013;**112** Suppl S1:18–9. [SR-INCONT49943]
Eren AE, Ersay AR, Alan C, Basturk G. Efficacy of early Duloxetine therapy in urinary incontinence occurred after radical prostatectomy (Abstract number S90). *European Urology Supplements* 2013;**12**(4):e1198. [SR-INCONT49916]
- Filocamo 2007** *{published data only}*
Del Popolo G, Filocamo M, Li Marzi V, Cecconi F, Marzocco M, Nicita G. Stress incontinence after radical prostatectomy: a randomized controlled trial on combination of duloxetine and rehabilitation versus rehabilitation alone (Abstract number 29). *Neurourology and Urodynamics* 2006;**25**(6):544–5. [SR-INCONT26612]
* Filocamo MT, Li Marzi V, Del Popolo G, Cecconi F, Villari D, Marzocco M, et al. Pharmacologic treatment in postprostatectomy stress urinary incontinence. *European Urology* 2007;**51**(6):1559–64. [SR-INCONT23000]
- Griebling 1999** *{published data only}*
Griebling TL, Kreder KJ, Suijffel CA, See WA. Timing of biofeedback and pelvic floor muscle exercise training for men undergoing radical prostatectomy (Abstract number 322). Proceedings of the 29th Annual Meeting of the International Continence Society; 1999 Aug 22–26; Denver, Colorado. 1999:401. [SR-INCONT9928]
* Suijffel C, Kreder K, See W. Improved continence outcomes with preoperative pelvic floor muscle strengthening exercises. *Urologic Nursing* 2001;**21**:201–10.
- Hotston 2006** *{published data only}*
Hotston MR, Hurley K, Patel S, Persad R. The use of duloxetine for stress incontinence after prostatectomy. *BJU International* 2006;**98**(4):916–7. [SR-INCONT26028]
- Ip 2004** *{published data only}*
Ip V. Evaluation of a patient education tool to reduce the incidence of incontinence post-prostate surgery. *Urologic Nursing* 2004;**24**(5):401–7.
- Kahihara 2006** *{published data only}*
Kahihara CT, Ferreira U, Pedro RN, Matheus WE, Netto NR. [Early versus delayed physiotherapy in the treatment of post-prostatectomy male urinary incontinence]. *Archivos Espanoles de Urologia* 2006;**59**(8):773–8.
- Lin 2012** *{published data only}*
Lin YH, Yu TJ, Lin VC, Wang HP, Lu K. Effects of early pelvic-floor muscle exercise for sexual dysfunction in radical prostatectomy recipients. *Cancer Nursing* 2012;**35**(2):106–14. [SR-INCONT46858]
- McGlynn 2004** *{published data only}*
McGlynn B, Al-Saffar N, Begg H, Gurun M, Hollins G, McPhee S, et al. Management of urinary incontinence following radical prostatectomy. *Urologic Nursing* 2004;**24**(6):475–82.
- Mishel 2002** *{published data only}*
Mishel MH, Belyea M, Germino BB, Stewart JL, Bailey DE Jr, Robertson C, et al. Helping patients with localized prostate carcinoma manage uncertainty and treatment side effects: nurse-delivered psychoeducational intervention over the telephone. *Cancer* 2002;**94**(6):1854–66. [SR-INCONT15336]
- Nehra 2001** *{published data only}*
Nehra A, Rovner E, Wein A, Lange P, Ellis W, Keane R, et al. Interim analysis of a multi-center study of extracorporeal magnetic innervation (ExMI) for the treatment of urinary incontinence following radical prostatectomy (Abstract). Proceedings of the 31st Annual Meeting of the International Continence Society; 2001 Sept 18–21; Seoul, Korea. 2001.
- Ottensbacher 2013** *{published data only}*
Ottensbacher A, Sloane R, Snyder DC, Kraus W, Sprod L, Demark-Wahnefried W. Cancer-specific concerns and physical activity among recently diagnosed breast and prostate cancer survivors. *Integrative Cancer Therapies* 2013;**12**(3):206–12. [SR-INCONT50477]
- Pemberton 2006** *{published data only}*
Pemberton P, Brooks A, Eriksen CM, Frost S, Graham S, Greenman L, et al. A comparative study of two types of urinary sheath. *Nursing Times* 2006;**102**(7):36–41.
- Prota 2012** *{published data only}*
Prota C, Gomes CM, Ribeiro LH, de Bessa J Jr, Nakano E, Dall'Oglio M, et al. Early postoperative pelvic-floor biofeedback improves erectile function in men undergoing radical prostatectomy: a prospective, randomized, controlled trial. *International Journal of Impotence Research* 2012;**24**(5):174–8. [SR-INCONT45891]
- Pulker 2002** *{published data only}*
Pulker E. Long term results of physiotherapy in men with urinary stress incontinence after radical prostatectomy (Abstract). Proceedings of the 32nd Annual Meeting of the International Continence Society; 2002 Aug 28–30; Heidelberg, Germany. 2002.

- Ribeiro 2013** *{published data only}*
Ribeiro AM, Oliveira HF. Pelvic Floor Muscles Training in Urinary Disorders in Men With Prostate Cancer Undergoing Radiotherapy. <http://clinicaltrials.gov/show/NCT01762956> 2013. [: NCT01762956; : sr-incont47831]
- Ricci 2004 NEWa** *{published data only}*
Ricci L, Minardi D, Romoli M, Galosi AB, Muzzonigro G. Acupuncture reflexotherapy in the treatment of sensory urgency that persists after transurethral resection of the prostate: a preliminary report. *Neurourology and Urodynamics* 2004;**23**(1):58–62. [: SR-INCONT16645]
- Robinson 2012** *{published data only}*
Robinson JP, Burrell SA, Avi-Itzhak T, McCorkle R. Validity testing of the stopwatch urine stream interruption test in radical prostatectomy patients. *Journal of Wound, Ostomy & Continence Nursing* 2012;**39**(5):545–51. [: SR-INCONT45900]
- Salinas Casado 1991** *{published data only}*
Salinas Casado J, Varela E, Prieto Chaparro L, Virseda Rodriguez M, Salomon S, Guerrero A, et al. Results of perineal electric stimulation in stress urinary incontinence [Resultados de la estimulación eléctrica perineal en la incontinencia urinaria de esfuerzo]. *Archivos Espanoles de Urologia* 1991;**44**(4):437–40.
- Salinas Casado 1996** *{published data only}*
Salinas Casado J, Virseda Chamorro M, Salomon Mohamed S, Bravo de Rueda C, Aristizabal JM, Resel Estevez L. Results of electrical stimulation in the treatment of post-prostatectomy urinary incontinence. *Actas Urológicas Espanolas* 1996;**20**(6):544–50.
- Seki 2005** *{published data only}*
Seki N, Kai N, Takano N, Naito S, Kawajiri M, Kira J, Tobimatsu S. Efficacy of high-frequency magnetic stimulation of the sacral root in patients with stress urinary incontinence following radical prostatectomy [abstract]. 35th Annual Meeting of International Continence Society; 2005 Aug 29 - Sep 2; Montreal, Canada.
- Shen 2012 NEWa** *{published data only}*
Shen YZ, Lin X, Lin Q. [Overactive bladder after transurethral resection of prostate treated with electroacupuncture therapy and tolterodine]. *Zhongguo Zhen Jiu = Chinese acupuncture & moxibustion* 2012;**32**(5):404–8. [: SR-INCONT47454]
- Traeger 2013** *{published data only}*
Traeger L, Penedo FJ, Benedict C, Dahn JR, Lechner SC, Schneiderman N, et al. Identifying how and for whom cognitive-behavioral stress management improves emotional well-being among recent prostate cancer survivors. *Psycho-Oncology* 2013;**22**(2):250–9. [: sr-incont48709]
- Yang 2010 NEWa** *{published data only}*
Yang BS, Ye DW, Yao XD, Peng JY, Zhang SL, Dai B, et al. [The study of electrical acupuncture stimulation therapy combined with pelvic floor muscle therapy for postprostatectomy incontinence]. [Chinese]. *Chung-Hua Wai Ko Tsa Chih [Chinese Journal of Surgery]* 2010;**48**(17):1325–7. [: SR-INCONT42595]
- Yao 2012** *{published data only}*
Yao J, Hirschhorn AD, Mungovan SF, Patel MI. Preoperative pelvic floor physiotherapy improves continence following radical prostatectomy (Abstract number 182). *Neurourology and Urodynamics* 2012;**31**(6):964–5. [: sr-incont50072]
- Zahariou 2009** *{published data only}*
Zahariou A, Kyriakides A. Intensive pelvic floor muscle training after radical prostatectomy improves continence outcomes (Abstract number S40). *European Urology Supplements* 2009;**8**(8):620. [: sr-incont49168]
- Zermann 1999** *{published and unpublished data}*
Zermann DH, Ishgooka M, Wunderlich H, Wilhelm S, Schubert J. Post-prostatectomy incontinence and pelvic floor dysfunction (abstract). Proceedings of the 29th Annual Meeting of the International Continence Society; 1999 Aug 22-26; Denver, Colorado. 1999.
* Zermann DH, Ishgooka M, Wunderlich H, Reichelt O, Schubert J. A study of pelvic floor function pre-and post radical prostatectomy using clinical neurourological investigations, urodynamics and electromyography. *European Urology* 2000;**37**:72–8.
- Zhang 2009** *{published data only}*
Zhang A, O'Neill J. Improving Continence and Quality of Life in Prostate Cancer Patients (StayDry). <http://clinicaltrials.gov/show/NCT01365182> 2009. [: NCT01365182; : StayDry; : sr-incont47806]

References to studies awaiting assessment

- Crivellaro 2011** *{published data only}*
Abbinante M, Crivellaro S, Palazzetti A, Tosco L, Frea B. Efficacy of ultrasound-guided pelvic muscle training (Abstract number 45). *Neurourology and Urodynamics* 2012;**31** Suppl 1:S35. [: sr-incont47301]
Crivellaro S, Abbinante M, Palazzetti A, Tosco L, Frea B. Efficacy of ultrasound-guided pelvic muscle training (Abstract number 285). *European Urology Supplements* 2012;**11**(1):e285a. [: sr-incont47272]
* Crivellaro S, Lorenzo T, Abbinante M, Martinez G, Palazzetti A, Frea B. Efficacy of pelvic training under transrectal ultrasonography (Abstract number 16). *Neurourology and Urodynamics* 2011;**30** Suppl 1:13–4. [: sr-incont47397]
- Delmastro 2010** *{published data only}*
Delmastro F, Marchisio C, Lamberti G, Giraud D. Urinary incontinence after radical prostatectomy: a randomized controlled trial comparing preoperative intensive pelvic muscle exercises with or without proprioceptive training (Abstract). *Neurourology and Urodynamics* 2010;**29**(2 Suppl):62–3. [: SR-INCONT39878]
- Lilli 2006 NEW** *{published data only}*
Lilli P, Mercuriali M, Fiori M, Hanitzsch H, Gunelli R, Bercovich E. Impact of preoperative biofeedback on incontinence in cancer patients undergoing radical

prostatectomy. *Archivio Italiano di Urologia e Andrologia* 2006;**78**(3):92–6. [: SR-INCONT25089]

Simeit 2010 NEW {published data only}

Simeit R, Deck R, Drechsler T, Fiedrich M, Schonrock-Nabulsi P. [Quality of life and impact of incontinence in male patients with prostate carcinoma after radical retropubic prostatectomy]. [German]. *Rehabilitation* 2010; **49**(3):180–9. [: SR-INCONT40661]

Zellner 2011 NEW {published data only}

Zellner M. [Incontinence after radical prostatectomy and cystectomy: are combined training with mechanical devices and whole body vibration effective?]. [German]. *Urologe (Ausg.A)* 2011;**50**(4):433–44. [: SR-INCONT41808]

Zhang 2013 {published data only}

Zhang A. The problem-solving therapy and urinary incontinence in prostate cancer patients (Abstract number 14-5). *Psycho-Oncology* 2013;**22** Suppl 2:33–4. [: NCT01365182; : sr-incont49941]

References to ongoing studies

Burnett 2012 {published data only}

NCT01748110, Burnett AL, Segal RL, Cheskin LJ, Blitz JU. Health Interventions in Men Undergoing Radical Prostatectomy - A Randomized Controlled Clinical Trial. <http://clinicaltrials.gov/show/NCT01748110> 2012.

Burnett 2013 {published data only}

Burnett AL, Tajkarimi K. Study of non-invasive Viberec© penile vibratory stimulation regimen to enhance recovery of erectile function/rigidity and urinary control/continence after nerve sparing radical prostatectomy (RP) for clinically localized prostate cancer. <http://clinicaltrials.gov/show/NCT01718704> 2013. [: NCT01718704; : sr-incont49360]

Fode 2012 NEW {published data only}

Fode M. Mechanical nerve stimulation in the treatment of post prostatectomy incontinence. <http://clinicaltrials.gov/show/NCT01540656> 2012. [: NCT01540656; : sr-incont49358]

Goode 2014 {published data only}

Goode PS. Perioperative Post-Prostatectomy Incontinence Home Telehealth Program (ProsTel). <http://clinicaltrials.gov/show/NCT01960998> 2014. [: NCT01960998; : ProsTel; : sr-incont49364]

Mina 2013 {published data only}

NCT02036684, Mina DS, Matthew AG, Carli F. A Multicentre, Pilot Randomized Controlled Trial to Examine the Effects of Prehabilitation on Functional Outcomes After Radical Prostatectomy. <http://clinicaltrials.gov/show/NCT02036684> 2013.

Ng 2011 {published data only}

Ng S-I. A Randomized Controlled Trial Study of the Efficacy of Intensive Preoperative Pelvic Floor Muscle Training to Decrease Post-prostatectomy Urinary Incontinence. <http://clinicaltrials.gov/show/NCT01338584> 2011. [: NCT01338584; : sr-incont47833]

Terrone 2007 {published data only}

Terrone C, Cisari C. Prevention of Urinary Incontinence After Prostatectomy. <http://clinicaltrials.gov/show/NCT00982098> 2007. [: NCT00982098; : sr-incont47873]

Zopf 2012 {published data only}

Zopf EM, Braun M, Machtens S, Zumbe J, Bloch W, Baumann FT. Implementation and scientific evaluation of rehabilitative sports groups for prostate cancer patients: study protocol of the ProRehab Study. *BMC Cancer* 2012; **12**:312. [: DRKS00004184; : SR-INCONT45125]

Additional references

Aboseif 1996

Aboseif SR, O'Connell HE, Usui A, McGuire EJ. Collagen injection for intrinsic sphincteric deficiency in men. *Journal of Urology* 1996;**155**:10–3.

Abrams 1991

Abrams PH. Investigation of post prostatectomy problems. *Urology* 1991;**15**:209–12.

Albertsen 1997

Albertsen PC, Lu-Yao GL, Warren J. Risk of complication and readmission associated with radical prostatectomy in community practice: A Medicare claims analysis. *Journal of Urology* 1997;**157** Suppl 4:93.

Altman 2013

Altman D, Cartwright R, Lapitan MC, Nelson R, Sillen U, Tikkinen K. Epidemiology of Urinary Incontinence (UI) and other Lower Urinary tract Symptoms (LUTS), Pelvic organ Prolapse (POP) and Anal Incontinence (AI). In: Abrams P, Cardozo L, Khoury S, Wein A editor(s). *Incontinence: 5th International Consultation on Incontinence. Recommendations of the International Scientific Committee: evaluation and treatment of urinary incontinence, pelvic organ prolapse and faecal incontinence; 2012 Feb 23-25; Paris*. Belgium: International Consultation on Urological Diseases, 2013:27–9.

Berghmans 1998

Berghmans LC, Hendriks HJ, Bo K, Hay-Smith EJ, de Bie RA, van Waalwijk van Doorn ES. Conservative treatment of stress urinary incontinence in women: a systematic review of randomized clinical trials. *British Journal of Urology* 1998;**82**:181–91.

Berghmans 2013

Berghmans B, Hendriks E, Bernards A, de Bie R, Omar MI. Electrical stimulation with non-implanted electrodes for urinary incontinence in men. *Cochrane Database of Systematic Reviews* 13, Issue 6. [DOI: 10.1002/14651858.CD001202.pub5]

Burnett 1998

Burnett AL, Mostwin JL. In situ anatomical study of the male urethral sphincteric complex: relevance to continence preservation following major pelvic surgery. *Journal of Urology* 1998;**160**(4):1301–6.

Chao 1995

Chao R, Mayo ME. Incontinence after radical prostatectomy: Detrusor or sphincter causes?. *Journal of Urology* 1995;**154**:16–8.

Donnellan 1997

Donnellan SM, Duncan HJ, MacGregor RJ, Russell JM. Prospective assessment of incontinence after radical retropubic prostatectomy: objective and subjective analysis. *Urology* 1997;**49**(2):225–30.

Eastham 1996

Eastham JA, Kattan MW, Rogers E, Goad JR, Ohori M, Boone TB, et al. Risk factors for urinary incontinence after radical prostatectomy. *Journal of Urology* 1996;**156**(5): 1707–13.

Fader 2007

Fader M, Cottenden Alan M, Getliffe K. Absorbent products for light urinary incontinence in women. *Cochrane Database of Systematic Reviews* 2007, Issue 2. [DOI: 10.1002/14651858.CD001406.pub2; : CD001406]

Fader 2008

Fader M, Cottenden Alan M, Getliffe K. Absorbent products for moderate-heavy urinary and/or faecal incontinence in women and men. *Cochrane Database of Systematic Reviews* 2008, Issue 4. [DOI: 10.1002/14651858.CD007408; : CD007408]

Ficazzola 1998

Ficazzola MA, Nititi VW. The etiology of post-radical prostatectomy incontinence and correlation of symptoms with urodynamic findings. *Journal of Urology* 1998;**160**: 1317–20.

Galloway 2000

Galloway N, El-Galley R, Sand P, Appell R, Russell H, Carlan S. Update on extracorporeal magnetic innervation (ExMI) therapy for stress urinary incontinence. *Urology* 2000;**56**(6A):82–6.

Golubuff 1995

Golubuff ET, Chang DT, Olsson CA, Kaplan SA. Urodynamics and the etiology of post-prostatectomy urinary incontinence: The initial Columbia experience. *Journal of Urology* 1995;**153**:1034–7.

Grise 2001

Grise P, Thurman S. Urinary incontinence following treatment of localized prostate cancer. *Cancer Control* 2001; **8**(6):532–9.

Groutz 2000

Groutz A, Blavais JG, Chaikin DC, Weiss JP, Verhaaren M. The pathophysiology of post-radical prostatectomy incontinence: a clinical and video urodynamic study. *Journal of Urology* 2000;**163**(6):1767–70.

Gudziak 1996

Gudziak MR, McGuire EJ, Gormley EA. Urodynamic assessment of urethral sphincter function in post-prostatectomy incontinence. *Journal of Urology* 1996;**156**: 1131–4.

Guyatt 2011a

Guyatt GH, Oxman AD, Schunemann HJ, Tugwell P, Knottnerus A. GRADE guidelines: a new series of articles in the Journal of Clinical Epidemiology. *Journal of Clinical Epidemiology* 2011;**64**(4):380–2.

Guyatt 2011b

Guyatt GH, Oxman AD, Sultan S, Glasziou P, Akl EA, Alonso-Coello P, et al. GRADE guidelines: 9. Rating up the quality of evidence. *Journal of Clinical Epidemiology* 2011; **64**(12):1311–6.

Guyatt 2013

Guyatt GH, Thorlund K, Oxman AD, Walter SD, Patrick D, Furukawa TA, et al. GRADE guidelines: 13. Preparing Summary of Findings tables and evidence profiles - continuous outcomes. *Journal of Clinical Epidemiology* 2013;**66**(2):173–83.

Guyatt 2013a

Guyatt GH, Oxman AD, Santesso N, Helfand M, Vist G, Kunz R, et al. GRADE guidelines: 12. Preparing Summary of Findings tables - binary outcomes. *Journal of Clinical Epidemiology* 2013;**66**(2):158–72.

Higgins 2003

Higgins JPT, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. *BMJ* 2003;**327**: 557–60.

Higgins 2011

Higgins JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org. Chichester, UK: John Wiley & Sons, Ltd.

Hunnskaar 2002

Hunnskaar S, Burgio K, Diokno AC, Herzog AR, Hjalmas K, Lapitan MC. Epidemiology and natural history of urinary incontinence. Incontinence: 2nd International Consultation on Incontinence. Plymouth, UK: Health Publications, 2002:165–200.

Jabs 2001

Jabs CF, Stanton SL. Urge incontinence and detrusor instability. *International Urogynecology Journal and Pelvic Floor Dysfunction* 2001;**12**(1):58–8.

Jacobsen 2007

Jacobsen NE, Moore KN, Estey E, Voaklander D. Open versus laparoscopic radical prostatectomy: a prospective comparison of postoperative urinary incontinence rates. *Journal of Urology* 2007;**177**(2):615–9.

Jahn 2007

Jahn P, Preuss M, Kernig A, Langer G, Seifert-Huehmer A. Types of indwelling urinary catheters for long-term bladder drainage in adults. *Cochrane Database of Systematic Reviews* 2007, Issue 3. [DOI: 10.1002/14651858.CD004997.pub2; : CD004997]

Juni 2001

Juni P, Altman DG, Egger M. Assessing the quality of randomized controlled trials. In: Egger M, Davey Smith

- G, Altman DG editor(s). *Systematic Reviews in Health Care: Meta-analysis in context*. 2nd Edition. London: BMJ Books, 2001:87–108.
- Khan 1991**
Khan Z, Mieza M, Starer P, Singh VK. Post-prostatectomy incontinence. A urodynamic and fluoroscopic point of view. *Urology* 1991;**38**(5):483–8.
- Kondo 2002**
Kondo A, Lin TL, Nordling J, Siroky M, Tammela T. Conservative management in men. Incontinence: 2nd International Consultation on Incontinence. Plymouth, UK: Health Publications, 2002:553–68.
- Leach 1995**
Leach GE. Post-prostatectomy incontinence: the importance of bladder dysfunction. *Journal of Urology* 1995;**153**(3 Pt 2):1038.
- Litwiler 1997**
Litwiler SE, McIntire DD, Schnitzer B, Roehrborn CG. Risk factors for incontinence following radical prostatectomy in a community practice setting [abstract]. Urodynamics Society Meeting. New Orleans, April 1997.
- MacDonald 2007**
MacDonald R, Fink HA, Huckabay C, Monga M, Wilt TJ. Pelvic floor muscle training to improve urinary incontinence after radical prostatectomy: a systematic review of effectiveness. *BJU International* 2007;**100**:76–81.
- Majoros 2006**
Majoros A, Bach D, Keszthelyi A, Hamvas A, Romics I. Urinary incontinence and voiding dysfunction after radical retropubic prostatectomy (prospective urodynamic study). *Neurourology and Urodynamics* 2006;**25**:2–7.
- McCammon 1999**
McCammon KA, Kolm P, Main B, Schellhammer PF. Comparative quality of life analysis after radical prostatectomy or external beam radiation for localized prostate cancer. *Urology* 1999;**54**(3):509–16.
- McGuire 1990**
McGuire EJ. Editorial comment: Pathophysiology of urinary incontinence after radical prostatectomy. *Journal of Urology* 1990;**143**:978.
- Milsom 2009**
Milsom I, Altman D, Lapitan MC, Nelson R, Sillen U, Thom D. Epidemiology of urinary (UI) and faecal (FI) incontinence and pelvic organ prolapse (POP). *Incontinence: 4th International Consultation on Incontinence*. Paris, France: Health Publication Ltd, 2009:35–112.
- Moore 2007**
Moore KN, Fader M, Getliffe K. Long-term bladder management by intermittent catheterisation in adults and children. *Cochrane Database of Systematic Reviews* 2007, Issue 4. [DOI: 10.1002/14651858.CD006008.pub2; : CD006008]
- Niël-Weise 2005**
Niël-Weise BS, van den Broek PJ. Urinary catheter policies for long-term bladder drainage. *Cochrane Database of Systematic Reviews* 2005, Issue 1. [DOI: 10.1002/14651858.CD004201.pub2; : CD004201]
- Omar 2014**
Omar MI, Lam T, Alexander C, Graham J, Mamoulakis C, Imamura M, et al. Systematic review and meta-analysis of the clinical effectiveness of bipolar compared with monopolar transurethral resection of the prostate (TURP). *BJU International* 2014;**113**:24–35. [DOI: 10.1111/bju.12281]
- Peyromaure 2002**
Peyromaure M, Ravery V, Boccon-Gibod I. The management of stress urinary incontinence after radical prostatectomy. *British Journal of Urology International* 2002;**90**(2):155–61.
- Rainwater 1988**
Rainwater LM, Zincke H. Radical prostatectomy after radiation for cancer of the prostate: feasibility and prognosis. *Journal of Urology* 1988;**140**(6):1455–9.
- Rassweiler 2006**
Rassweiler J, Teber D, Kuntz R, Hofmann R. Complications of Transurethral Resection of the Prostate (TURP) - Incidence, management, and prevention. *European Association of Urology* 2006;**50**:969–80.
- Reference Manager 2012**
Reference Manager Professional Edition Version 12. New York: Thomson Reuters 2012.
- Silva 2011**
Silva LA, Andriolo RB, Atallah AN, da Silva EMK. Surgery for stress urinary incontinence due to presumed sphincter deficiency after prostate surgery. *Cochrane Database of Systematic Reviews* 2011, Issue 4. [DOI: 10.1002/14651858.CD008306.pub2]
- Thompson 2002**
Thompson DL. The national coverage decision for reimbursement for biofeedback and pelvic floor electrical stimulation for treatment for urinary incontinence. *Journal of Wound, Ostomy & Continence Nursing* 2002;**29**:11–9.
- Turner 2004**
Turner DA, Shaw C, McGrother CW, Dallosso HM, Cooper NJ, MRC Incontinence Team. The cost of clinically significant urinary storage symptoms for community dwelling adults in the UK. *BJU International* 2004;**93**(9): 1246–52.
- Uebersax 1995**
Uebersax JS, Wyman JF, Shumaker SA, McClish DK, Fantl JA. The Continence Program for Women Research Group. Short forms to assess life quality and symptom distress for urinary incontinence in women: The Incontinence Impact Questionnaire and the Urogenital Distress Inventory. *Neurourology and Urodynamics* 1995;**14**:131–9.
- Ware 1993**
Ware JE. Measuring patients' views: the optimum outcome measure. *BMJ* 1993;**306**(6890):1429–30.

Wilson 2001

Wilson L, Brown J, Shin GP, Luc K, Subak L. Annual direct cost of urinary incontinence. *Obstetrics and Gynecology* 2001;**98**(3):398–406.

Winters 1997

Winters JC, Rackley RR, Fralick RA, Simich SC, Appell RA. Urodynamic findings in post-prostatectomy incontinence [Abstract 398]. *Journal of Urology* 1997;**157** Suppl 4:102.

References to other published versions of this review**Campbell 2012**

Campbell SE, Glazener CMA, Hunter KF, Cody JD, Moore KN. Conservative management for postprostatectomy urinary incontinence. *Cochrane Database of Systematic Reviews* 2012, Issue 1. [DOI: 10.1002/14651858.CD001843.pub4]

Hunter 2004

Hunter KF, Moore KN, Cody DJ, Glazener CMA. Conservative management for postprostatectomy urinary

incontinence. *Cochrane Database of Systematic Reviews* 2004, Issue 2. [DOI: 10.1002/14651858.CD001843.pub2]

Hunter 2007

Hunter KF, Moore KN, Glazener CMA. Conservative management for postprostatectomy urinary incontinence. *Cochrane Database of Systematic Reviews* 2007, Issue 2. [DOI: 10.1002/14651858.CD001843.pub3]

Moore 1999b

Moore KN, Cody DJ, Glazener CM. Conservative management for post prostatectomy urinary incontinence. *Cochrane Database of Systematic Reviews* 1999, Issue 4. [DOI: 10.1002/14651858.CD001843]

Moore 2001

Moore KN, Cody DJ, Glazener CM. Conservative management for post prostatectomy urinary incontinence. *Cochrane Database of Systematic Reviews* 2001, Issue 2. [DOI: 10.1002/14651858.CD001843]

* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Ahmed 2012

Methods	RCT
Participants	<p>Time of recruitment: Pre-operatively</p> <p>Population: 95 men after radical prostatectomy (whole population, with or without UI)</p> <p>Included: men who underwent RP for clinically localized prostate cancer. Patients were not taking anticholinergic drugs or any drug that may affect continence for the duration of the study</p> <p>Excluded: previous urethral, bladder or prostate surgery, prior urinary or faecal incontinence, neurogenic and psychiatric disorders, pre-operative urinary tract complications, radiotherapy</p> <p>Age (mean, SD): A 57.2 (3.25); B 58.8 (5.4); C 56.3 (6.8)</p> <p>Dropouts: 10 A: 4 (2 received radiotherapy, 2 had post-operative complications); B: 4 (2 received radiotherapy, 2 refused follow up); C: 2 (2 received radiotherapy) No differential dropout</p> <p>Baseline characteristics: Comparable at baseline</p>
Interventions	<p>Time of intervention: Post-operative treatment</p> <p>A (26): PFMT alone. At catheter removal men received standard care of verbal and written instructions, active instructions from physiotherapist to perform 3 sets of 15 to 20 contractions daily, for a duration of 3 to 5 seconds with a 6 to 10 second rest period, encouraged to perform exercises before functional activities such as sneezing, coughing, or lifting weight, also in the supine position, sitting, squatting and going up and down stairs</p> <p>B (26): ES: treatment started one week after catheter removal, patients received 15 minutes of twice weekly electrical stimulation for 12 weeks</p> <p>C (28): PFMT + BFB + ES: treatment started one week after catheter removal, patients received twice weekly treatment with 15 minutes of electrical stimulation and 15 minutes of biofeedback for 12 weeks, instructed to perform 3 series of 10 rapid contractions, 3 sustained contractions of 5, 7 or 10 seconds and then 10 contractions during prolonged expiration in the supine position</p> <p>All patients were given a logbook to complete daily regarding self-report of exercises</p> <p>Duration of treatment: 12 weeks</p> <p>Follow up: 6, 12 and 24 weeks</p>
Outcomes	<p>Primary outcome (number of men with UI)</p> <p>Number of incontinent men (defined as some pads required and weight gain of the pad > 1 g during the test)</p> <p>Baseline: A 22/26; B 22/26; C 23/28</p> <p>2 months: A 21/26; B 19/26; C 18/28</p> <p>3 months: A 17/26; B 12/26; C 20/28</p> <p>6 months: A 9/26; B 6/26; C 1/28</p> <p>Other outcomes</p> <p>Leakage weight in grams on 24 hour pad test (mean (SD) N)</p> <p>Baseline: A 791 (380.3) 26; B 790 (399.46) 26; C 785 (311.98) 28</p>

	2 months: A 533 (316.53) 26; B 383 (145.87) 26; C 263 (145.87) 28 3 months : A 260 (216.53) 26; B 132 (145.87) 26; C 83 (145.87) 28 6 months : A 123 (116.53) 26; B 98 (105.87) 26; C 36 (95.87) 28 Quality of life (Higher score = worse) Mean scores of IIQ-7 (mean (SD) N) 2 months: 40 (23) 26; B 36 (25) 26; C 26 (25) 28 3 months: 32 (26) 26; B 29 (28) 26; C 20 (24) 28 6 months: 25 (26) 26; B 23 (24) 26; C 15 (25) 28	
Notes		
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomised using "a computer-generated random-number list"
Allocation concealment (selection bias)	Low risk	"sealed envelopes"
Blinding of participants (performance bias)	High risk	Blinding to treatment not possible
Blinding of personnel (performance bias)	Unclear risk	"One experienced physiotherapist delivered all therapy"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Low risk	4 (2 received radiotherapy, 2 had post-operative complications) ; B: 4 (2 received radiotherapy, 2 refused follow-up); C: 2 (2 received radiotherapy). No differential dropout
Selective reporting (reporting bias)	Low risk	All outcomes in methods were reported
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk.
Approved by medical ethics committee	Low risk	"At the time of this study, there was no Human Research Ethics Committee established in the faculty, but the study was approved by the postgraduate affairs and departmental committee"
Informed consent	Low risk	"All patients signed an informed consent form"
ITT analysis	Low risk	Assumed from flow diagram of patients

Bales 2000

Methods	Randomised: yes Method of allocation: not stated Blinding: Outcome assessment nurse not involved in intervention Dropouts: None mentioned
Participants	Recruitment: pre-operative Included: all men undergoing radical prostatectomy N = 100 consecutive patients with stage T1c to T2c prostate cancer undergoing radical retropubic prostatectomy by a single surgeon randomised into 2 groups
Interventions	Pre-operative intervention Group A (50) intervention: 2 to 4 weeks prior to surgery, participants underwent a 45 minute session with nurse trained in biofeedback. Patients were instructed to perform graded PFMT. Contractions of 5 to 10 seconds, 10 to 15 repetitions were performed with biofeedback (surface electrodes used to measure muscle strength). Advised to practice the exercises 4 times per day until surgery Group B (50) control: no biofeedback training. Written and brief verbal instructions from a nurse on how to perform PFMT (isolate muscle that stops urine flow, practice 4 times per day, 10 to 15 repetitions) Both groups: Encouraged to perform PME 4 times per day after catheter removal 2 weeks post-operatively Length of follow-up: 6 months
Outcomes	Main outcome: time to return of continence measured by number of pads used Continence definition: use of 1 pad or less per day Data collection: at 1, 2, 3, 4, and 6 months post-operatively There was no significant difference in incontinence between the groups
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No description
Allocation concealment (selection bias)	Unclear risk	"Randomised"
Blinding of participants (performance bias)	High risk	Blinding not possible
Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Outcome assessment nurse not involved in intervention

Bales 2000 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Three patients dropped out of the biofeedback arm of the study because they never completed their biofeedback session
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	No description
Approved by medical ethics committee	Unclear risk	Not reported
Informed consent	Unclear risk	Not reported
ITT analysis	Unclear risk	Not specified

Burgio 2006

Methods	<p>Randomised: yes</p> <p>Method of allocation: stratified by age and tumour differentiation, then randomised using computer generated random numbers, block size of 4 to ensure equity of number in each group</p> <p>Blinding: intervention providers and bladder diary scorers were blinded</p> <p>Dropouts: 6 participants in the intervention group, and 7 in the control were excluded after randomisation as surgery was cancelled. At 6 months, 6 in the intervention and 4 in the control were lost to follow-up</p>
Participants	<p>Recruitment: pre-operative</p> <p>Included: all men undergoing radical prostatectomy</p> <p>N = 125 volunteer patients randomised, 13 excluded after randomisation</p> <p>Analysis on N = 112 men aged 53 to 68 years who underwent radical prostatectomy for prostate cancer. To be eligible, the men had to be ambulatory, continent and identified at least 1 week prior to their surgery</p>
Interventions	<p>Pre-operative intervention</p> <p>Group A (57) intervention: single session of biofeedback (rectal probe to measure intra-abdominal rectal pressure and external anal sphincter contraction) assisted behavioural training. Feedback and verbal instruction used to teach control of pelvic muscles. Taught to contract sphincter during 2 to 10 seconds periods separated by 2 to 10 seconds of relaxation, dependent on ability. Written instructions for daily at home practice of 45 PFM exercises daily (3 sessions of 15 exercises each time). Additionally instructed to slow or interrupt voiding once daily. Encouraged to exercise daily preoperatively, then resume when catheter removed post-operatively</p> <p>Group B (55) control: usual care of brief verbal instructions post operatively to interrupt the voiding stream plus any instruction from physician</p> <p>Length of follow-up: 6 months</p>
Outcomes	<p>Main outcome:</p> <p>Continual or episodic urine loss using bladder diaries, incontinent pads or other products</p>

	<p>Secondary outcomes: Impact of incontinence and quality of life pre-operatively and at follow-up contacts by IIQ, SCL-90-R and SF-36 Continenence definition: 3 consecutive weekly 1 day diaries showing no leakage or a 7 day diary showing no leakage Data collection: 1 day bladder diaries mailed in each week. Questionnaire on bladder control, lifestyle and 7 day bladder diary at 6 weeks, 3 months and 6 months post-surgery Time to continence was significantly reduced in the intervention group. The intervention group had a significantly smaller proportion of those with severe or continual leakage at 6 months, and stress type urine loss. No differences on quality of life, return to work or activities between the groups</p>	
Notes	Analysis by "intention to treat". Additional data supplied to KFH by author	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Stratified by age and tumour differentiation, then randomised using computer generated random numbers, block size of 4 to ensure equity of number in each group
Allocation concealment (selection bias)	Low risk	Computer allocated. "The randomization schedule was implemented by the research nurse, so that interventionists would be blinded to the next group assignment."
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Low risk	Intervention providers and bladder diary scorers were blinded
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Bladder diary scorers were blinded
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	6 and 4 lost to follow-up at 6 months; 6 and 7 excluded after randomisation as surgery cancelled
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	"Supported by Grant RO1 DK50283 from the National Institute for Diabetes and Digestive and Kidney Diseases, National Institutes of Health" "The funding organization did not participate in the design or conduct of the study;"

Burgio 2006 (Continued)

		collection, management, analysis or interpretation of the data; or the preparation, review or approval of the manuscript.”
Approved by medical ethics committee	Low risk	“This study was reviewed and approved by the University and VA Medical center Institutional Review Boards for Human use”
Informed consent	Unclear risk	“All participants provided informed consent”
ITT analysis	Low risk	“intention to treat”. Patient flow diagram

Centemero 2009

Methods	Randomised: yes Method of allocation: 100 consecutive patients Blinding: no
Participants	Number of men 100 Recruitment: pre-operative Included: all men undergoing radical prostatectomy Excluded: impaired mental status, BMI.27, diabetes mellitus, neurological-rheumatic-immune disease, neck-urethral surgery, prior catheterisation, post-operative catheterisation time longer than 6 days Aged: 48-68 years
Interventions	Group A (50) intervention: PFMT both pre and post-operatively. A structured PFMT program 30 and 15 days before surgery, previous physiotherapist evaluation to provide the patients with feedback about the quality of pelvic floor muscle function, PC test (endurance and contraction quality), breathing co-ordination, typify muscle contraction as tonic and modify incorrect physical attitudes. This was also repeated after the procedure Group B (50) intervention: PFMT post-operatively only (no details as to whether this is the same as the treatment pre-operatively above) Duration of treatment: not stated Length of follow-up: at one and three months
Outcomes	UI at 1 month: A 33/59; B 47/59 3 month: A 24/59; B 37/59 24 hour pad test, number of subjects with pad test weight of > 150 g 1 month: A 15/59; B 20/59 3 month: A 10/59; B 19/59 Quality of life measured by the ICS male sf questionnaire, mean score 1 month: A 14.6 (6.36) 59; B 18.3 (6.36) 59 3month: A 8.1 (7.04) 59; B 12.2 (6.36) 59 Satisfaction scale (PGI-I) used only for Group A and 75% reported extreme satisfaction for pre-operative PFMT

Notes		
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Individuals were randomised by a computer-generated list that was centrally maintained". "Permuted block randomisation was used, with a block size of every 10 consecutively enrolled participants"
Allocation concealment (selection bias)	Low risk	"Individuals were randomised by a computer-generated list that was centrally maintained". "Permuted block randomisation was used, with a block size of every 10 consecutively enrolled participants"
Blinding of participants (performance bias)	High risk	Blinding not possible
Blinding of personnel (performance bias)	Low risk	"The surgeon who performed the procedures was blinded to randomisation allocation throughout the study"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	"Only the statistician and the data monitoring committee saw unblinded data"
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No description. It appears that there were no loss to follow-up
Selective reporting (reporting bias)	Unclear risk	Protocol not available. Therefore judged to be unclear risk
Financial support	Low risk	None
Approved by medical ethics committee	Low risk	"The study was approved by the university institutional review board"
Informed consent	Low risk	Patients were "provided written informed consent"
ITT analysis	Low risk	Assumed from patient flow chart

Methods	RCT
Participants	<p>Time of recruitment: pre-operative</p> <p>Population: men having a laparoscopic radical prostatectomy (whole population, with or without UI)</p> <p>Included: patients with prostate cancer, undergoing laparoscopic radical prostatectomy</p> <p>Excluded: neurological disorders, a medical history with invasive perineal and/or rectal surgery, preoperatively existing stress urinary incontinence, radiation, ≥ 75 years</p> <p>Age (mean, SD): A 63.7 (5.3); B 63.7 (5.3)</p> <p>Dropouts: 9 from A (1 unable to understand Dutch, 3 post-operative radiotherapy, 1 oesophageal cancer, 3 discontinued intervention at own request, 1 excluded due to poor compliance) 8 from B (2 post operative radiotherapy, 1 pelvic lymph node dissection, 1 died of cause unrelated to prostate cancer, 5 discontinued intervention at own request, 1 prolonged catheter) Not differential dropout</p> <p>Baseline characteristics: comparable at baseline</p>
Interventions	<p>Time of intervention: pre-operative (+ postoperative treatment for all men)</p> <p>A (56): 30 mins of guided PFMT + biofeedback weekly for 4 weeks before surgery, received written instructions to: carry out two sets of 30 contractions during abdominal breathing, one breath between each contraction; restart PFMT after catheter removal (7 to 10 days after surgery)</p> <p>B (46): received written instructions on PFMT after catheter removal (7 to 10 days after surgery)</p> <p>All men were seen before surgery by a physiotherapist, who explained relevant anatomy, anal visual inspection and digital palpation, biofeedback registration with rectal probe</p> <p>All patients received PFMT + biofeedback and/or electrical stimulation if still incontinent after 6 weeks</p> <p>Duration of treatment</p> <p>Follow up: 6 weeks, 3 months, 6 months, 9 months and 12 months after surgery</p>
Outcomes	<p>Primary outcome (number of men with UI)</p> <p>Number of incontinent men (leakage on 24 hour pad test)</p> <p>12 months: A 20/58; B 9/45</p> <p>Other outcomes</p> <p>Number of continent men after 1 year (no leakage at all on 24 hour pad test)</p> <p>12 months: 38/58; B 36/45</p> <p>Adverse effects:</p> <p>A 0/56; B 0/46</p> <p>Quality of life</p> <p>King's Health Questionnaire (KHQ) (mean (SD) N):</p> <p>General health</p> <p>12 months: A 24.48 (50.7) 56; B 29.64 (50.7) 46</p> <p>Role limitations</p> <p>12 months: A 21.36 (22.2) 56; B 17.73 (22.2) 46</p> <p>Physical limitations</p> <p>12 months: A 16.49 (15.45) 56; B 13.48 (15.45) 46</p> <p>Social limitations</p> <p>12 months: A 7.98 (24.8) 56; B 4.15 (24.8) 46</p> <p>Personal</p>

	12 months: A 18.72 (4.4) 56; B 19.62 (4.4) 46 Emotional 12 months: A 5.08 (7.0) 56; B 4.24 (7.0) 46 Sleep or energy disturbance: A 9.13 (39.0) 56; B 6.13 (39.0) 46 Symptom severity: A 14.62 (86.1) 56; B 10.93 (86.1) 46
Notes	Trial was stopped early because interim analysis found no benefit for group A Additional information supplied by author
Risk of bias	
Bias	Authors' judgement Support for judgement
Random sequence generation (selection bias)	Low risk "Computer-generated random numbers with block randomization and variable block size"
Allocation concealment (selection bias)	Low risk "central computer system"
Blinding of participants (performance bias)	Unclear risk "participants were also blinded until their first visit to the pelvic floor physiotherapist"
Blinding of personnel (performance bias)	Low risk "The pelvic floor physiotherapists were blinded to randomization" (to pre-operative randomisation)
Blinding of outcome assessment (detection bias) All outcomes	Low risk Outcome assessor blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk 9 from A (1 unable to understand Dutch, 3 post-operative radiotherapy, 1 oesophageal cancer, 3 discontinued intervention at own request, 1 excluded due to poor compliance) 8 from B (2 post-operative radiotherapy, 1 pelvic lymph node dissection, 1 died of cause unrelated to prostate cancer, 5 discontinued intervention at own request, 1 prolonged catheter á demeure). Not differential dropout
Selective reporting (reporting bias)	Low risk All outcomes in methods were reported
Financial support	Low risk None
Approved by medical ethics committee	Low risk "Medical ethical approval was obtained from the Medical Ethics committee of our university hospital"
Informed consent	Low risk "Informed consent was obtained"
ITT analysis	Low risk Assumed from flow diagram

Dubbelman 2004

Methods	Randomised: yes
Participants	<p>Recruitment: post-operative</p> <p>Included: men incontinent post-radical prostatectomy (≥ 1 g urine loss on 1 hour pad test), one week after catheter removal</p> <p>Excluded: pre-operative UI</p> <p>N = 66 men completing the trial, 33 in intervention group, 33 in control</p> <p>All participants had a radical retropubic prostatectomy and lived within 75 km of hospital</p> <p>Age range 61 to 67 years</p>
Interventions	<p>Post-operative intervention</p> <p>A (35) intervention: 9 or less sessions of physiotherapy guided pelvic floor exercises after surgery plus information folder</p> <p>B (44) control: exercise instruction through information folder only</p> <p>Length of follow-up: 6.5 months</p> <p>Dropouts: A 1, B 2 due to stricture; + A 1, B 3 refused further measurements; + B 5 withdrew consent or 1 did not understand</p>
Outcomes	<p>Continence definition: incontinence defined as loss of at least 1 gram of urine on 1 hour pad test and 4 grams on the 24 hour pad test</p> <p>Main outcome: urinary incontinence on both 1 hour (> 1 g) and 24 hour (> 4 g) pad tests</p> <p>Secondary outcome: urodynamic study (urethral pressure profilometry)</p> <p>Data collection: 1 and 26 weeks after catheter removal</p> <p>Number of wet men at 6 months: A: 17/33, B: 20/33</p> <p>No significance difference in continence rates between the groups</p>
Notes	<p>Sample size required 96 men in each arm</p> <p>Other data presented as median (IQR)</p>

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number generator to achieve 1:1 ratio
Allocation concealment (selection bias)	Low risk	Sealed envelopes, sequentially numbered, opened by trial nurse after result of pad test was known
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Unclear risk	"The physiotherapist who guided men in the PGPFME group was unaware of the outcome data of both treatment groups"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	"The data for outcome assessment (e.g. pad-tests, voiding diaries) were collected and entered in a data base by a trial nurse who was not involved in the treatment or intervention"

Dubbelman 2004 (Continued)

Incomplete outcome data (attrition bias) All outcomes	High risk	13 dropped out (of which 2 from intervention group)
Selective reporting (reporting bias)	Low risk	All outcomes in methods reported
Financial support	Unclear risk	No description
Approved by medical ethics committee	Low risk	“approved by our institutional review board”
Informed consent	Low risk	“informed consent”
ITT analysis	Unclear risk	“the concept of an intent to treat analysis was not applied”. Authors also state, “Participants were analysed in the group to which they were allocated at randomization”

Fader 2013

Methods	RCT Cross-over design
Participants	<p>Time of recruitment: post-operative</p> <p>Population: 74 men with incontinence after prostate surgery</p> <p>Included: men who were experiencing incontinence more than a year after prostate cancer treatment and using absorbent pads</p> <p>Excluded: no description</p> <p>Age (mean, SD): no description</p> <p>Dropouts: no information</p> <p>Baseline characteristics: no information</p>
Interventions	<p>Time of intervention: post-operative</p> <p>A: penile compression device (clamp)</p> <p>B: sheath drainage system (sheath)</p> <p>C: body-worn urinals (BWU)</p> <p>D: pads alone</p> <p>All men tested each device for three weeks and asked to state which device was preferred</p> <p>Duration of treatment: 3 weeks with each device</p> <p>Follow-up: 3 months</p>
Outcomes	<p>Primary outcome (number of men with UI) Not reported</p> <p>Other outcomes</p> <p>Overall opinion: patient satisfaction questionnaire related to device performance</p> <p>Asked to state which device they preferred:</p> <p>Pads were most highly rated compared with sheaths (P = 0.31), clamps (P < 0.01) and BWUs (P < 0.001)</p> <p>The clamp was rated as more secure, less leaky and less restrictive of clothing choice than the others (P < 0.05) but was more painful than the rest (P < 0.002)</p> <p>Three months later asked which products they were actually using and for what activities and circumstances:</p>

Fader 2013 (Continued)

	30/56 using a combination of devices and pads	
	Quality of life EORTC QLC C30 IIQ-7 ICIQ-UI King's Health Questionnaire	
Notes	Awaiting further information from author	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"random order" cross-over design
Allocation concealment (selection bias)	Unclear risk	"random order"
Blinding of participants (performance bias)	High risk	Blinding was not possible for participants
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No information. Therefore judged to be unclear risk
Selective reporting (reporting bias)	High risk	Quality of life outcome not reported
Financial support	Low risk	Prostate Cancer UK
Approved by medical ethics committee	Low risk	Southampton and South West Hampshire Research Ethics Committee (REC)
Informed consent	Low risk	Yes
ITT analysis	Unclear risk	Not specified

Filocamo 2005

Methods	<p>Randomised: yes</p> <p>Method of allocation: block randomisation, block size of 4 for 2 groups (A and B) with only one permutation code (ABBA)</p> <p>Blinding: not described</p> <p>Dropouts: at 12 months, 2 participants dropped out of the control group</p> <p>Intention to treat: yes</p>
Participants	<p>Recruitment: post-operative</p> <p>Included: all men undergoing RRP</p> <p>N = 300 consecutive men post RRP, randomised after catheter removal to 2 groups</p> <p>Intervention group: N = 150</p> <p>Control group: N = 150</p>
Interventions	<p>Post-operative intervention</p> <p>Group A (150) intervention: formal instruction (3 treatment sessions plus at home exercises) in PFMT using verbal explanation, palpation and visualization of the base of the penis with a mirror, in different positions and prior to sneezing, coughing or lifting</p> <p>Group B (150) control: no formal instruction</p> <p>Length of follow-up: 12 months</p>
Outcomes	<p>Main outcome: urine loss on 1 hour and 24 hour pad tests plus number of pads used daily</p> <p>Continence definition: 0 to 1 pads per day</p> <p>Data collection: 1, 3, 6, and 12 months</p> <p>Wet (leakage or use of pads)</p> <p>1 month: A 145/150, B 147/150</p> <p>3 months: A 115/150, B 129/150</p> <p>6 months: A 35/150, B 102/150</p> <p>12 months: A 16/150, B 49/148</p> <p>Surgical implantation of artificial urinary sphincter: A 2/150, B 3/148</p>
Notes	<p>74% of the intervention group achieved continence at 3 months compared to only 30% of the control (a significant difference favouring intervention)</p> <p>Differences between the groups declined between 6 to 12 months, with most participants achieving continence in 1 year</p>

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Block randomisation, block size of 4 for 2 groups (A and B) with only one permutation code (ABBA)
Allocation concealment (selection bias)	Unclear risk	Not stated. Therefore judged to be unclear risk
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible

Filocamo 2005 (Continued)

Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description of blinding of pad test or data entry from questionnaires
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	2 dropped out of control group but none from intervention
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Low risk	“Approved by the Ethics Committee of our Institution”
Informed consent	Low risk	“All patients signed an informed consent form”
ITT analysis	Unclear risk	Not specified

Floratos 2002

Methods	Randomised: yes Method of allocation: randomised 2:1 to intervention: control groups Blinding: not mentioned Dropouts: 1 participant randomised to intervention unable to follow intervention protocol (unable to attend clinic, provided with control intervention) Intention to treat: yes
Participants	Recruitment: post-operative Included: men incontinent post-radical prostatectomy one week after catheter removal N = 42 consecutive patients
Interventions	Post-operative intervention Group A (28) intervention: initiated after catheter removal. Intervention group received 15 treatment sessions (3 times per week for 30 minutes) of PFMT with EMG (surface) biofeedback in clinic Group B (14) control: instruction with verbal feedback and an information pamphlet with instructions to perform PME 50 to 100 times daily at home Length of follow-up: 6 months
Outcomes	Main outcome: incontinence episodes measured by 1 hour pad test and continence questionnaire (pads used, number of incontinence episodes) Continence definition: incontinence defined as a urine loss of > 1 g on the 1 hour pad test; 2 or more pads/day a not deemed a “socially acceptable continence rate” Data collection: baseline, 1, 2, 3 and 6 months

	Level of incontinence in both groups declined over the 6 months of the study. Control group had less urine loss and appeared to regain continence sooner, but the difference was not significant	
Notes	Additional data supplied to KFH by author	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Allocation concealment (selection bias)	Unclear risk	Randomised 2:1 to intervention: control groups
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	High risk	1 dropped out of intervention group but followed control intervention - unclear if analysed as control
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Low risk	"Patients were informed about the aims and perspectives of the study. Eligible patients consented"
ITT analysis	Unclear risk	"Analysed using the intention-to-treat approach". Authors also state "One of the patients initially randomized to group A could not follow the programme but performed PMEs under verbal instruction"

Methods	RCT
Participants	<p>Time of recruitment: pre-operative</p> <p>Population: 83 men undergoing nerve sparing radical prostatectomy (whole population, with or without UI)</p> <p>Included: sexually active men with an IIEF score of at least 18 without aids, continent pre-operatively</p> <p>Excluded: condition that may prevent patient being able to have post-operative treatment with PDE5-inhibitor</p> <p>Age (mean, range): A 62 (46-73); B 65 (49 to 76)</p> <p>Dropouts: 12 from group A (3 excluded because underwent non-nerve sparing surgery, 2 withdrew consent, 1 lost a partner, 6 non-compliance), 3 from group B (2 excluded because underwent non-nerve sparing surgery, 1 withdrew consent). Differential dropout</p> <p>Baseline characteristics: comparable except Group A significantly more LUTS pre-operatively</p>
Interventions	<p>Time of intervention: pre-operative + post-operative</p> <p>A (30): pre-operative session guided PFMT + instruction on how to use penile vibratory stimulation device, instructed to stimulate frenulum once daily, 10 seconds of stimulation then 10 second pause, repeated 10 times for 1 week pre-operatively, Instructed to restart stimulation after catheter removal for 6 weeks</p> <p>B (38): pre-operative session guided PFMT</p> <p>All men were offered a PDE5 inhibitor after 1 month post-operatively and also received telephone contact to ensure compliance with treatment</p> <p>Duration of treatment: 6 weeks</p> <p>Follow up: 3, 6 and 12 months post-operatively</p>
Outcomes	<p>Primary outcome (number of men with UI)</p> <p>Number of incontinent men (men reporting use of more than one pad daily)</p> <p>3 months: A 14/42; B 15/41</p> <p>6 months: A 7/42; B 3/41</p> <p>12 months: A 3/30; B 2/38</p> <p>(dropout figures added to 3 and 6 months)</p> <p>Other outcomes</p> <p>Continence rate (patients reporting use of up to one pad daily for security reasons only)</p> <p>3 months: A 65.5%; B 62.9%, P = 0.83</p> <p>6 months : A 83.3%; B 91.9%, P = 0.28</p> <p>12 months : A 90%; B 94.7%, P = 0.46</p> <p>Median (range) pad use</p> <p>3 months: A 1 (0 to 6); B 5 (0 to -34), P = 0.09</p> <p>6 months: A 0 (0 to 3); B 1/3 (0 to 6), P = 0.14</p> <p>12 months: A 0 (0 to 2); B 0 (0 to 3), P = 0.56</p> <p>Median (range) IIEF-5</p> <p>3 months : A 5 (0 to 25); B 5 (0-25), P = 0.25</p> <p>6 months : A 10.5 (0 to 25); B 5 (0-25), P = 0.08</p> <p>12 months : 18 (0 to 25); B 7.5 (0-25), P = 0.09</p> <p>IIEF \geq 18, n/N (%)</p> <p>3 months: 5/30 (17); B 4/38 (11), P = 0.46</p> <p>6 months: 13/30 (43); B 9/38 (24), P = 0.09</p>

	<p>12 months: 16/30 (53); B 12/38 (32), P = 0.07 Adverse effects: A: 5/30 reported side effects as a result of penile vibratory stimulation (1 red spots on glans penis, 1 small laceration + some bleeding, 2 complained of soreness, 1 frank pain post-operatively) B: 0/38 Quality of life Median (range) DAN-PSS post-operatively 3 months: A 1 (0 to 34); B 5 (0-34), P = 0.74 6 months: A 2 (0 to 41); B 1 (0-48), P = 0.74 12 months: A 3 (0 to 36); B 0.5 (0-21), P = 0.13</p>	
Notes	<p>Further information provided by authors PDE5 (phosphodiesterase type 5) inhibitor is used for erectile dysfunction</p>	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"randomized prospective trial" and "randomized by a draw"
Allocation concealment (selection bias)	Low risk	Used opaque sealed envelopes
Blinding of participants (performance bias)	High risk	"It was not possible to create a believable sham device, which could maintain blinding of the study subjects"
Blinding of personnel (performance bias)	Unclear risk	Not reported. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	High risk	Outcome assessor not blinded
Incomplete outcome data (attrition bias) All outcomes	High risk	12 from group A (3 excluded because underwent non-nerve sparing surgery, 2 withdrew consent, 1 lost a partner, 6 non-compliance), 3 from group B (2 excluded because underwent non-nerve sparing surgery, 1 withdrew consent). Differential dropout
Selective reporting (reporting bias)	Low risk	Outcomes in methods reported
Financial support	Low risk	"This study was funded by unrestricted grants from the Velux Foundation and Grosserer L.F. Foghts Foundation"
Approved by medical ethics committee	Low risk	"The study was approved by the Danish ethical counsel and the Danish Data protection Agency"
Informed consent	Low risk	Assumed as they acquired ethical approval

ITT analysis	Low risk	Assumed from patient flow diagram
--------------	----------	-----------------------------------

Franke 1998

Methods	Randomised: yes Method of allocation: not stated Blinding: none Dropouts: 2 with gravitational incontinence consistent with intrinsic sphincter deficiency Intention to treat: not clear
Participants	Recruitment: post-operative Included: men incontinence post-radical prostatectomy at 6 weeks post surgery N = 30 men: 6 weeks post-radical prostatectomy with post-void residual of < 50 ml; no previous TURP, no urinary tract infection, no neurological conditions
Interventions	Post-operative intervention. Group A (13): intervention, biofeedback (perineal patch EMG) enhanced PFMT; exercise treatment sessions at 6, 7, 9, 11, and 16 weeks post-operatively Group B (10): control, completed bladder diary but did not have any other intervention Length of follow-up: 12 months
Outcomes	Main outcome: urine loss measured by voiding diary, 48 hour pad test (reported as mean grams of urine lost in 24 hours), and incontinence questionnaire Continence definition: not clear. Participants described as “completely dry” or with “significant incontinence” Data collection: 6, 12 and 24 weeks There were no significant differences between treatment or control groups on any of the outcome measures at any of the measurement intervals
Notes	Numbers in the groups unclear as 5 withdrew from the study after initial randomisation. Not clear how many were in each group prior to follow-up at 6 weeks

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Allocation concealment (selection bias)	Unclear risk	“Randomised”
Blinding of participants (performance bias)	High risk	Blinding not possible. Therefore judged to be at high risk
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk

Franke 1998 (Continued)

Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Five men withdrew after initial randomisation. Dropouts from 25 left at 6 weeks appears to be 10
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	None
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Low risk	“Informed consent was obtained”
ITT analysis	Unclear risk	Not specified

Geraerts 2013

Methods	RCT
Participants	<p>Time of recruitment: pre-operative</p> <p>Population: men having a radical prostatectomy (whole population, with or without UI)</p> <p>Included: men planning to undergo open radical prostatectomy (ORP) or robot-assisted laparoscopic radical prostatectomy (RARP)</p> <p>Willing to accept ambulatory visits once a week until total continence was achieved; willing to perform measurements pre-operatively and at 1 month, 3 months, 6 months and 12 months after surgery</p> <p>Excluded: cognitive problems; non-Dutch speaking; simultaneous other surgery; transport problems; lack of time; psychosocial/other medical problems; refused participation; insisted on preoperative PFMT; not approachable; not enough time between diagnosis and date of planned surgery</p> <p>Age (mean, SD): A 62 (5.90); B 62 (6.33)</p> <p>Dropouts: 6 from A: (1 died, 1 cerebrovascular accident, 3 transport problems, 1 refused further participation) 4 from B: (2 transport problems, 2 refused further participation). Not differential dropout</p> <p>Baseline characteristics: Comparable at baseline</p>
Interventions	<p>Time of intervention: pre-operative</p> <p>A (85): 30 mins of guided PFMT + biofeedback weekly for 3 weeks before surgery instructed to: carry out 60 contractions a day at home; contract their pelvic floor while coughing, and sitting down or getting up from a chair; restart PFMT on day 4 after surgery while catheter was in situ</p> <p>B (85): instructed to start PFMT on the day after catheter removal (e.g. 2 to 3 weeks</p>

	<p>after surgery)</p> <p>All men performed an individual guided exercise programme with digital or EMG biofeedback postoperatively weekly, delivered by a therapist (blinded to group allocation) different from the pre-operative Group A therapist. This included advice on using PF muscles to prevent leakage during functional activities</p> <p>Duration of treatment: as long as any degree of UI persisted</p> <p>Follow up: 1 month, 3 months, 6 months and 12 months after surgery</p>
Outcomes	<p>Primary outcome (number of men with UI)</p> <p>Number of incontinent men (1 hour pad test defined as ≤ 1 g)</p> <p>1 month: A 37/85; B 35/86, P = 0.758</p> <p>3 months: A 15/86; B 15/86, P = 1.000</p> <p>6 months: A 8/86; B 5/85, P = 0.566</p> <p>12 months: A 7/81; B 7/83, P = 1.000</p> <p>Other outcomes</p> <p>Cumulative incidence of number of continent men</p> <p>1 month: A 44/85; B 44/85</p> <p>3 months: A 67/85; B 71/85</p> <p>6 months: A 80/85; B 80/85</p> <p>12 months: A 83/85; B 81/85</p> <p>Point prevalence of continence, 1 hour pad test, defined as 0 g</p> <p>1 month: A 42/85; B 41/86</p> <p>3 months: A 63/86; B 61/86</p> <p>6 months: A 76/86; B 73/85</p> <p>12 months: A 68/81; B 73/83</p> <p>Point prevalence of continence, VAS scale, defined as $\leq 1/10$</p> <p>1 month: A 35/89; B 38/88</p> <p>3 months: A 64/88; B 52/87</p> <p>6 months: A 73/88; B 65/86</p> <p>12 months: A 72/84; B 62/84</p> <p>Urine loss on 24 hour pad test in grams (mean (SD) N):</p> <p>1 month: A 90 (?) 85; B 85 (?) 85</p> <p>3 months: A 17 (?) 85; B 13 (?) 85</p> <p>6 months: A 12 (?) 85; B 3 (?) 85</p> <p>12 months: A 2 (?) 85; B 3 (?) 85</p> <p>Quality of life</p> <p>International prostate Symptom Score (IPSS), King's Health Questionnaire (KHQ): data not given</p> <p>Only one aspect of the King's Health Questionnaire, incontinence impact, favoured A at 3 (P = 0.008) and 6 months (P = 0.024) after surgery</p>
Notes	Some men had pre-operative incontinence
Risk of bias	
Bias	Authors' judgement Support for judgement

Geraerts 2013 (Continued)

Random sequence generation (selection bias)	Unclear risk	Sequence of randomisation was carried out using a “computer program” and was “determined by the patients’ presence at the outpatient urology clinic”. It is unclear what influence the patients’ presence had on randomisation
Allocation concealment (selection bias)	Low risk	“Allocation to the treatment groups was concealed”. Method not reported
Blinding of participants (performance bias)	High risk	Blinding was not possible for participants
Blinding of personnel (performance bias)	Low risk	Post-operative treatment was delivered by a therapist who was blinded to group allocation and treatment delivered by the pre-operative Group A therapist
Blinding of outcome assessment (detection bias) All outcomes	Low risk	“One blinded and well-trained assessor performed the measurements”
Incomplete outcome data (attrition bias) All outcomes	Low risk	Dropouts: Group A: 6 (1 died, 1 cerebrovascular accident, 3 transport problems, 1 refused further participation); Group B: 4 (2 transport problems, 2 refused further participation)
Selective reporting (reporting bias)	High risk	Results not reported for quality of life outcomes
Financial support	Low risk	Unconditional funding from the “Agency for innovation by Science and Technology (Applied Biomedical Research); governmental grant”
Approved by medical ethics committee	Low risk	“Ethical approval from the commission on medical ethics of the University Hospitals Leuven”
Informed consent	Low risk	Patients “signed written informed consent”
ITT analysis	Low risk	“Data were analyzed according to the intention-to-treat principle”

Ghanem 2013

Methods	RCT
Participants	<p>Time of recruitment: pre-operative</p> <p>Population: 100 men undergoing a radical prostatectomy (whole population, with or without UI)</p> <p>Included: men undergoing RP for clinically localized prostate cancer.</p> <p>Excluded: patients who had previous pelvic organ surgeries, patients with central or peripheral neurologic diseases</p> <p>Age (mean, SD): not reported</p>

	Dropouts: not reported Baseline characteristics: not reported	
Interventions	Time of intervention: pre-operative (post-operative treatment for all men) A (50): pre-operative PFMT for 2 weeks + post-operative PFMT programme B (50): post-operative PFMT programme only Duration of treatment Follow-up: 3.5, 4.5, 12, 13 and 13.5 months	
Outcomes	Primary outcome (number of men with UI) Number of incontinent men (defined as using > 1 pad on pad test) 12 months: A 2/50; B 3/50 13 months: A 2/50; B2/50 Other outcomes Quality of life ICS male SF questionnaire, results not reported	
Notes		
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Patients were divided randomly"
Allocation concealment (selection bias)	Unclear risk	Not reported. Therefore judged to be unclear risk
Blinding of participants (performance bias)	High risk	Blinding to treatment not possible
Blinding of personnel (performance bias)	Unclear risk	Not reported. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Selective reporting (reporting bias)	Unclear risk	Protocol not available. Therefore judged to be unclear risk
Financial support	Low risk	None
Approved by medical ethics committee	Low risk	"Faculty of Physical Therapy Ethical committee, Cairo University"
Informed consent	Low risk	Yes

ITT analysis	Unclear risk	Not specified
--------------	--------------	---------------

Glazener RP 2011

Methods	RCT
Participants	Recruitment: post-operative Included: men with persistent urinary incontinence at 6 weeks after radical prostatectomy Excluded: radiotherapy planned; unable to comply with study or intervention; previous formal PFMT Age (mean, SD): A 62.4 (5.8); B 62.3 (5.6)
Interventions	A (205): one-to-one therapy sessions including PFMT and BT if OAB or urgency symptoms + PFMT and lifestyle leaflet Duration of treatment: 4 sessions in 3 months starting 6 weeks after surgery B (206): control group with standard care + lifestyle leaflet only, no individual PFMT instruction or sessions
Outcomes	UI defined as positive response to ICIQ-SF questionnaire UI at 3 months: A 172/200, B 176/198 UI at 6 months: A 158/197, B 158/197 UI at 9 months: A 144/191, B 157/194 UI at 12 months: A 148/196, B 151/195 Severe UI at 12 months: A 74/196, B 78/195 UI episodes at 12 months from diaries (mean (SD N): A 3 (3.8) 105, B 2.9 (3) 106 ICI-Q score at 12 months (mean (SD N): A 4.9 (4.1) 196, B 5.4 (4.5) 195 QoL due to UI at 12 months (mean (SD N): A 1.4 (2) 193, B 1.7 (2.3) 193 Use of pads at 12 months: A 63/159, B 68/161 Men not doing PFMT at 12 months: A 63/191, B 91/189 Erectile dysfunction (no erection): A 105/189, B 105/190 QALYs virtually identical Cost: NHS intervention cost was GBP 181 higher in intervention group (95% CI 107 to 255) Other outcomes: use of other protection, catheters, sheath catheters, urinary frequency, nocturia, faecal incontinence, urgency, constipation, EQ5D, SF-12
Notes	Low dropout rates ICI-Q score: 0 = no UI, no effect on QoL; 21 = maximum amount, frequency and effect on QoL QoL due to UI measured using ICIQ-SF: 0 = no effect, 10 = maximum effect Compliance with therapy high

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated, minimised on centre, age and pre-existing urinary incontinence

Glazener RP 2011 (Continued)

Allocation concealment (selection bias)	Low risk	Remote computer allocation
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible for men
Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible for therapists
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Outcomes from questionnaires completed by men, data entry clerks blinded to group
Incomplete outcome data (attrition bias) All outcomes	Low risk	No differential dropout from the groups
Selective reporting (reporting bias)	Low risk	Outcomes in methods were reported
Financial support	Low risk	“The trial was funded by the National Institute of Health Research Health Technology Assessment (NIHR HTA) Programme (project number 03-14-03) and will be published in full in Health Technology Assessment. HSRU, HERU, and NMAHP RU are funded by the Chief Scientist Office of the Scottish Government Health Directorates”
Approved by medical ethics committee	Low risk	“Our trials were approved by the Multicentre Research Ethics Committee, Edinburgh, Scotland and overseen by an independent trial steering committee and a separate independent data monitoring committee”
Informed consent	Low risk	“All men gave signed informed consent”
ITT analysis	Low risk	“We used intention-to-treat analysis”

Glazener TURP 2011

Methods	RCT
Participants	Recruitment: post-operative Included: men with persistent urinary incontinence at 6 weeks after transurethral resection of the prostate (TURP) Excluded: radiotherapy planned; channel TURP for palliation for prostate cancer; unable to comply with study or intervention; previous formal PFMT Age (mean, SD): A 68.2 (7.7); B 67.9 (8.1)
Interventions	A (220): one-to-one therapy sessions including PFMT and BT if OAB or urgency symptoms + PFMT and lifestyle leaflet Duration of treatment: 4 sessions in 3 months starting 6 weeks after surgery B (222): control group with standard care + lifestyle leaflet only, no individual PFMT instruction or sessions

Outcomes	<p>UI defined as positive response to ICIQ-short form questionnaire</p> <p>UI at 3 months: A 142/205, B 132/208</p> <p>UI at 6 months: A 140/199, B 129/201</p> <p>UI at 9 months: A 133/197, B 131/202</p> <p>UI at 12 months: A 126/194, B 125/203</p> <p>Severe UI at 12 months: A 48/194, B 49/203</p> <p>UI episodes at 12 months from diaries (mean (SD N): A 1.4 (2.3) 175, B 1.2 (2.2) 179</p> <p>ICI-Q score at 12 months (mean (SD N): A 3.9 (3.7) 194, B 4 (4.3) 203</p> <p>QoL due to UI at 12 months (mean (SD N): A 1.2 (1.9) 190, B 1.3 (2.2) 199</p> <p>Use of pads at 12 months: A 24/146, B 24/136</p> <p>Men not doing PFMT at 12 months: A 66/188, B 154/193</p> <p>Erectile dysfunction (no erection): A 52/177, B 43/178</p> <p>QALYs virtually identical</p> <p>Cost: NHS intervention cost was GBP 209 higher in intervention group (95% CI 147 to 271)</p> <p>Other outcomes: use of other protection, catheters, sheath catheters, urinary frequency, nocturia, faecal incontinence, urgency, constipation, EQ5D, SF-12</p>
----------	---

Notes	<p>Low dropout rates</p> <p>ICI-Q score: 0= no UI, no effect on QoL; 21 = maximum amount, frequency and effect on QoL</p> <p>QoL due to UI measured using ICIQ-SF: 0 = no effect, 10 = maximum effect</p> <p>Compliance with therapy high</p>
-------	---

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated, minimised on centre, age and pre-existing urinary incontinence
Allocation concealment (selection bias)	Low risk	Remote computer allocation
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible for men
Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible for therapists
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Outcomes from questionnaires completed by men, data entry clerks blinded to group
Incomplete outcome data (attrition bias) All outcomes	Low risk	No differential dropout from the groups
Selective reporting (reporting bias)	Low risk	Outcomes in methods were reported

Financial support	Low risk	“The trial was funded by the National Institute of Health Research Health Technology Assessment (NIHR HTA) Programme (project number 03-14-03) and will be published in full in Health Technology Assessment. HSRU, HERU, and NMAHP RU are funded by the Chief Scientist Office of the Scottish Government Health Directorates”
Approved by medical ethics committee	Low risk	“Our trials were approved by the Multicentre Research Ethics Committee, Edinburgh, Scotland and overseen by an independent trial steering committee and a separate independent data monitoring committee”
Informed consent	Low risk	“All men gave signed informed consent”
ITT analysis	Low risk	“We used intention-to-treat analysis”

Goode 2009

Methods	Randomised controlled trial
Participants	<p>Recruitment: post-operative</p> <p>Included: men incontinent 1 to 16 years after radical prostatectomy (mean years since operation: A 5.1, B 3.9, C 5.1)</p> <p>N = 208 (prior to dropout). Analysis of 172 men at 8 weeks</p> <p>Age between 51 to 84 years</p> <p>% of men with prior PFMT instruction: A 36%, B 56%, C 47%</p> <p>% of men using antimuscarinics: A 16%, B 20%, C 28%</p> <p>% of men with urgency UI: A 1%, B 3%, C 2%</p> <p>% of men with stress UI: A 44%, B 47%, C 44%</p> <p>% of men with mixed UI: A 54%, B 50%, C 54%</p>
Interventions	<p>A (70): behavioural therapy with PFMT alone for 8 weeks</p> <p>B (70): behavioural therapy with biofeedback and electrical stimulation for 8 weeks</p> <p>C (68): control, no treatment for 8 weeks, then offered choice of intervention A or B</p> <p>Behavioural therapy consisted of pelvic floor muscle exercises and bladder control strategies in both groups</p> <p>Dropouts: A 19 at 6 months, 23 at 12 months; B 22 at 6 months, 36 at 12 months; C 3 at 8 weeks</p> <p>Length of follow-up: 12 months for groups A and B C transferred to treatment at 8 weeks so no further follow up possible</p>
Outcomes	<p>Frequency of UI, mean accidents in a week</p> <p>Number of continent men at 8 weeks: A 11/70, B 12/70, C 4/68</p> <p>Incontinence episodes per day at 8 weeks (mean, SD, N): A 1.86 (0.56) 58; B 1.71 (0.54) 54; C: 3 (1.17) 64</p> <p>Change in quality of life at 8 weeks using EPIC UI subscale (bigger change is better, mean, SD, N): A 13.1 (15.5) 58; B 12.3 (14.6) 54; C 2.9 (12.4) 64</p> <p>Adverse events: A 0/70, B 2/70 (haemorrhoidal irritation), C 0/68</p>

Goode 2009 (Continued)

	Patient's Global Perceptions of Improvement (much better): A 90%, B 91%, C 10% Completely satisfied with treatment progress: A 47%, B 47%, C not reported Compliance with PFMT and bladder control strategies at 8 weeks: A 100%, B 93% Compliance at 6 months: A 82%, B 84% Compliance at 12 months: A 91%, B 81%	
Notes	Some baseline differences between groups, did not quite reach statistical significance High dropout rates No data available for control group after eight weeks as all received treatment	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Stratified by site, type and frequency of UI, generated by computer programme
Allocation concealment (selection bias)	Low risk	Sealed envelopes, opened sequentially
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Unclear risk	Data entry staff blinded to group
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Outcomes from questionnaires completed by men, data entry staff blinded to group
Incomplete outcome data (attrition bias) All outcomes	High risk	Analysis and reported tables on 172 men
Selective reporting (reporting bias)	Low risk	Results of outcomes reported
Financial support	Low risk	National Institutes of Health - National Institute of Diabetes and Digestive and Kidney Diseases, grant R01 DK60044-01A2
Approved by medical ethics committee	Low risk	Approved by "University of Alabama at Birmingham Institutional Review Board"
Informed consent	Low risk	Yes
ITT analysis	Unclear risk	Not specified

Hoffman 2005

Methods	Randomised: yes Method of allocation: computerised randomisation Blinding: unclear Dropouts: 1 participant from each intervention group had dropped out by discharge; 15 dropouts from the perineal group, 31 from the anal group and 5 from the control group dropped out by 3 months Intention to treat: no
Participants	Recruitment: post-operative Included: men incontinent post-radical prostatectomy in an inpatient rehabilitation program N= 180 men (prior to dropouts). Randomly assigned to 3 groups (60 in each group)
Interventions	Post-operative intervention Group A (60) intervention: perineal ES plus physiotherapy (PFMT) Group B (60) intervention: anal ES plus physiotherapy (PFMT) Group C (60) control: PFMT alone. Length of follow-up: 3 months
Outcomes	Main outcome: urine loss measure on 1 hour pad test Secondary outcomes: quality of life (QLQ-C30) Continence definition: self-reports of incontinence Data collection: admission and discharge from the rehabilitation program and at 3 months after discharge All groups improved on continence and quality of life. Use of ES was only of additional value in a compliant subgroup. Perineal ES was better accepted than anal
Notes	Additional data supplied to KFH by author

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Computerised randomisation
Allocation concealment (selection bias)	Unclear risk	Method of allocation concealment not specified
Blinding of participants (performance bias)	Unclear risk	Insufficient information to permit judgement
Blinding of personnel (performance bias)	Unclear risk	Insufficient information to permit judgement
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Insufficient information to permit judgement

Hoffman 2005 (Continued)

Incomplete outcome data (attrition bias) All outcomes	High risk	Dropouts: 22 out of 60 in anal ES group, 4 out of 60 in perineal ES group. No reasons for dropouts given
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Unclear risk	Not reported. Therefore judged to be unclear risk
ITT analysis	High risk	No intention-to-treat analysis; insufficient information on methods of statistical analysis; interventions unclear and insufficiently specified

Hou 2013

Methods	RCT
Participants	<p>Time of recruitment: pre-operative</p> <p>Population: 66 men who underwent TURP (whole population, with or without UI)</p> <p>Included: patients with benign prostatic hyperplasia and underwent TURP, aged 60 to 90 years, remarkable lower urinary tract symptoms (LUTS) with poor response to medication, ambulatory, able to communicate verbally</p> <p>Excluded: indwelling catheter-dependent postdischarge, neurogenic bladder, dementia or disability affecting verbal communication</p> <p>Age (mean, SD): A 69.67 (6.09); B 71.41 (6.67)</p> <p>Dropouts: 5 (2 catheter still in situ after discharge from hospital, 3 lost to follow-up). Not differential dropout</p> <p>Baseline characteristics: comparable at baseline</p>
Interventions	<p>Time of intervention: post-operative treatment</p> <p>A (32): guided PFMT + EMG biofeedback after catheter removal (2 days postoperatively), instructed to: contract pelvic muscles for 5 seconds and relax for 10 seconds. After discharge, patients were instructed to carry out 5 mins of each PFE three times daily. Patients also received motivational telephone interviews once weekly</p> <p>B (29): no description</p> <p>Duration of treatment: 12 weeks</p> <p>Follow up: 1 week, 1 month, 2 months and 3 months</p>
Outcomes	<p>Primary outcome (number of men with UI)</p> <p>Not reported</p> <p>Other outcomes</p>

Quality of life		
SF-36 scores (mean (SD) N)		
Physical component		
3 months: A 54.86 (8.62) 32; B 49.86 (11.23) 29		
Physical functioning		
3 months: A 89.69 (17.13) 32; B 85.82 (21.60) 29		
Body pain		
3 months: A 93.66 (15.16) 32; B 89.48 (22.71) 29		
General health		
3 months: A 82.03 (14.05) 32; B 64.93 (27.16) 29		
Physical role limitation		
3 months: A 68.75 (36.48) 32; B 51.72 (38.92) 29		
Mental health component		
3 months: A 56.21 (6.20) 32; B 48.52 (11.94) 29		
Mental role limitation		
3 months: A 93.75 (21.48) 32; B 73.81 (37.80) 29		
Vitality		
3 months: A 80.47 (13.16) 32; B 64.14 (24.02) 29		
Mental health		
3 months: A 88.00 (10.51) 32; B 77.38 (18.68) 29		
Social functioning		
3 months: A 90.63 (14.20) 32; B 76.29 (29.57) 29		
Notes		
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly classified"
Allocation concealment (selection bias)	Unclear risk	"randomly classified"
Blinding of participants (performance bias)	High risk	Blinding to intervention was not possible
Blinding of personnel (performance bias)	High risk	Blinding not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Low risk	5 (2 catheter still in situ after discharge from hospital, 3 lost to follow-up). Not differential dropout
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk

Hou 2013 (Continued)

Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Unclear risk	Not reported. Therefore judged to be unclear risk
ITT analysis	Unclear risk	Not reported. Therefore judged to be unclear risk

Joseph 2000

Methods	Randomisation: yes Method of allocation: not described Blinding: none Dropouts: 3 did not return to clinic for all appointments, one had other health problems Intention to treat: no
Participants	Recruitment: post-operative Included: men incontinent post-radical prostatectomy or post-TURP. UI of at least 6 months duration N = 11 patients at least 6 months post-surgery (4 radical retropubic, 6 radical peritoneal, 1 TURP)
Interventions	Post-operative intervention Group A (6): intervention: Instruction in PFMT including biofeedback with visual feedback as well as verbal to assist in identifying and discriminating muscles Group B (5): comparator: Instruction in PFMT, squeezing of finger during digital rectal examination Both: weekly visit for a total of 4 clinic visits Length of follow-up: 12 months
Outcomes	Main outcome: urine loss measure by standardised pad test, bladder diary, subjective estimation of degree of incontinence Secondary outcomes: leak point pressure measured by video-urodynamics, Joseph Continence Assessment Tool Continence definition: subjective evaluation by participants Data collection: baseline, 3, 6, and 12 months No differences between the groups. Improvement seen in all patients at 12 months
Notes	Data not published in article. Raw data supplied to review author (KFH) who calculated means and standard deviations. These were reviewed by a second review author (KNM)

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk

Joseph 2000 (Continued)

Allocation concealment (selection bias)	Unclear risk	Reported as “Randomised”. No additional information provided
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk.\
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Three dropouts
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Unclear risk	Not reported. Therefore judged to be unclear risk
ITT analysis	High risk	No

Koo 2009

Methods	Randomised: yes
Participants	Recruitment: post-operative Included: men with UI after radical prostatectomy Randomised: N = 32
Interventions	A (16) intervention: extra-corporeal magnetic innervation (ExMI), treatment sessions were for 20 minutes twice weekly for 8 weeks B (16) control: PFMT alone. Duration of treatment not specified Length of follow-up: six months
Outcomes	24 hour pad test, g of urine Baseline: A 655, B 646 1 month: A 147, B 187 2 months: A 33, B 81, P = 0.001 3 months: A 9 (SD 28), B 45 (28), P = 0.001 6 months: Less than 10 g in both groups Number of pads used daily Baseline: A 4.2, B 4.1

Koo 2009 (Continued)

	I month: A 1.5, B 1.8 2months: A 0.6, B 0.9, P = 0.033 3 months: A 0.1 (0.42), B 0.6 (0.42), P = 0.002 6 months: A 0, B 0.1 Quality of life measured by I-QoL	
Notes	Awaiting further translation - information from abstract only SDs calculated using P values	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No description, Chinese language
Allocation concealment (selection bias)	Unclear risk	"Randomly assigned"
Blinding of participants (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No description Therefore judged to be unclear risk
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported, Chinese language
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Unclear risk	Not reported. Therefore judged to be unclear risk
ITT analysis	Unclear risk	Not reported. Therefore judged to be unclear risk

Laurienzo 2013

Methods	RCT
Participants	Time of recruitment: pre-operative Population: men having a radical prostatectomy (whole population, with or without UI) Included: patients with prostate cancer (stage T2) and candidates for RPP who were referred for treatment

	<p>Excluded: radiotherapy (previous or after RPP), previous transurethral resection, pre-existing neurological disease, urinary fistula after RPP, prolonged indwelling urethral catheterization (more than 15 days), clinical situations that rendered the patient unsuitable for surgical procedure, failure to attend all PFMR or electrical stimulation sessions, loss of follow-up and desistance</p> <p>Age (mean, SD): A 64 (8); B 62 (7); C 60 (8)</p> <p>Dropouts: 9 (2 failed to attend all sessions, 2 desistance, 1 adjuvant radiotherapy, 1 postoperative urethral stenosis, 1 urinary fistula, 1 unsuitable for surgery due to cardiovascular risk, 1 inadequate follow up) Unclear from which group</p> <p>Baseline characteristics: Comparable at baseline</p>
Interventions	<p>Time of intervention: pre-operative only</p> <p>A (15): standard treatment with verbal instructions for PFMT</p> <p>B (17): pre-operative guided PFMT, with 10 physiotherapy sessions: contractions of the pelvic floor muscles for 5 seconds in “dorsal decubitus” position for 10 times, in the same position with the waist elevated (10 times), lying down with legs adducted against a plastic ball performed 10 times and standing and flexing the hips to 60° (10 times)</p> <p>C (17): pre-operative PFMT + electrical stimulation during 10 physiotherapy sessions, electrical stimulation was with an anal probe lasting 15 minutes in total, and men also received guided PFMT and followed the same training regime as above</p> <p>Men did not receive PFMT post-operatively</p> <p>Duration of treatment: 10 pre-operative sessions</p> <p>Follow up: 1, 3 and 6 months</p>
Outcomes	<p>Primary outcome (number of men with UI)</p> <p>Not reported</p> <p>Other outcomes</p> <p>1 hour pad test score (mean (SD) N)</p> <p>1 month: A 17.6 (38.5) 15; B 29.5 (35.8) 17; C 25.5 (35.4) 17</p> <p>3 months: 14.3 (34.4) 15; B 11.8 (28.4) 17; C 9.6 (18.8) 17</p> <p>6 months: A 5.5 (14.16) 15; B 25.3 (59) 17; 4.35 (7.3) 17</p> <p>Quality of life</p> <p>ICIQ-SF score (mean (SD) N)</p> <p>1 month: A 7.5 (5) 15; B 14 (3.6) 17; C 9.6 (6.3) 17</p> <p>3 months: A 5.4 (5.2) 15; B 6.9 (5.8) 17; C 7.2 (6.4) 17</p> <p>6 months: A 3.7 (5.3) 15; B 4.8 (5.3) 17; C 5.3 (5.5) 17</p> <p>SF-36</p> <p>Results not reported: “There were no differences between groups on the various domains of the SF-36 (p > 0.05)”</p>
Notes	
Risk of bias	
Bias	Authors’ judgement Support for judgement

Laurienzo 2013 (Continued)

Random sequence generation (selection bias)	Low risk	“The patients were randomized (computer generated list using Randomizer, v4)”
Allocation concealment (selection bias)	Unclear risk	“The patients were randomized (computer generated list using Randomizer, v4)”
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Unclear risk	“PFMR was performed in the preoperative period by the same physiotherapist.”
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	9 (2 failed to attend all sessions, 2 desistance, 1 adjuvant radiotherapy, 1 post-operative urethral stenosis, 1 urinary fistula, 1 unsuitable for surgery due to cardiovascular risk, 1 inadequate follow-up). Unclear from which group
Selective reporting (reporting bias)	High risk	Results of SF-36 not reported
Financial support	Low risk	“Sao Paulo State Foundation for Research Support - FAPESP (number 08/54585-1)”
Approved by medical ethics committee	Low risk	“After approval by the ethical committee and internal review board, 58 consecutive males were included in this analysis”
Informed consent	Low risk	“All subjects received and signed an informed consent form”
ITT analysis	Low risk	Data presented for all men randomised and not excluded. No differential dropout apparent

Liu 2008

Methods	Randomised controlled clinical trial
Participants	Recruitment: post-operative Included: men with UI after radical prostatectomy Randomised: N = 24
Interventions	Group A (12) intervention: extra-corporeal magnetic innervation (ExMI), the frequency of the pulse field was 10 Hz for 10 minutes, followed by a 3 minute rest and a second treatment of 50 Hz for 20 minutes. This was done twice a week Group B (12) control: PFMT alone, instructions given to carry out 20 mins x 3 a day Duration of treatment: six weeks Length of follow up: 1, 3 and 6 months

Liu 2008 (Continued)

Outcomes	Main outcome measures: quality of life scale and the ICI-Q-SF 1 month: both scores were decreased with no significant differences between the groups At 3 and 6 months: both scores decreased with group A having a significantly lower (better) score than group B ($P < 0.05$)	
Notes	Information from abstract, awaiting translation of paper	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Quote "randomly assigned". No additional information provided
Allocation concealment (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of participants (performance bias)	High risk	Blinding not possible
Blinding of personnel (performance bias)	High risk	Blinding not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Low risk	All 24 patients included in the final analysis
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Low risk	Hospital board, local military university hospital
Informed consent	Unclear risk	Not reported. Therefore judged to be unclear risk
ITT analysis	Unclear risk	Not specified. Therefore judged to be unclear risk

Manassero 2007

Methods	<p>Randomised: prospective randomised controlled trial</p> <p>Method of allocation: computer generated random numbers</p> <p>Blinding: blinded outcome assessors, not instructors</p> <p>Dropouts: 12 excluded as the couldn't attend regularly for PFMT; 33 continent after surgery and were not randomised; 13 lost to follow-up in the control group (5 social reasons and 8 non-responders)</p> <p>Intention to treat: no</p>
Participants	<p>Recruitment: post-operative</p> <p>Included: men incontinent (UI > 2g/24 hour pad test), post-radical prostatectomy who were able to attend hospital</p> <p>Excluded: those with a history of preoperative incontinence, significant perioperative complications, rectal lesion, infection, psychiatric neurological disorders, inability to contract PF muscles or weak contraction with increased detrusor activity</p> <p>Mean age: A 66.8 (6.3 years), B 67.9 (5.5 years)</p>
Interventions	<p>Group A (54) intervention: PFMT re-education program, verbal feedback</p> <p>The training program involved active PFE. Verbal feedback of the contraction was used to instruct the patients to correctly and selectively contract their pelvic muscles while relaxing the abdominal muscles. The strength of the pelvic floor muscles was measured by digital anal control using a score of 0 to 5 (0 = no contraction, 5 = good contraction against strong resistance)</p> <p>Initially home practice comprised 45 contractions (3 sessions of 15) per day at home, progressively increasing the number until 90 per day. This was taught by two experienced urologists</p> <p>Group B (53) control: no treatment</p> <p>Duration of treatment: up to a year or until incontinence ceased</p> <p>Length of follow-up: 1, 3, 6 and 12 months</p>
Outcomes	<p>UI at -</p> <p>1 month: A 83.3% (45/54), B 97.5% (39/40), P = 0.04</p> <p>3 months: A 53.7% (29/54), B 77.5% (31/40), P = 0.03</p> <p>6 months: A 33.3% (18/54), B 60% (24/40), P = 0.01</p> <p>12 months: A 16.6% (9/54), B 52.5% (21/40), P < 0.01</p> <p>Subjective assessment of continence using VAS: P = 0.01 at 12 months</p> <p>Quality of life (single question): P = 0.03 at 12 months</p>
Notes	<p>ITT analysis used for data entry, assuming that all 13 men who dropped out of the control group were dry, because of differential dropout of 13 men from B versus none from A with no explanation for difference between groups</p> <p>If unable to contract anal sphincter or strength 2 or less, not randomised. These men were given ES treatment at home with anal probe</p>

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated random numbers

Manassero 2007 (Continued)

Allocation concealment (selection bias)	Low risk	Stratified on volume of urine lost on pad test
Blinding of participants (performance bias)	High risk	Blinding of intervention not possible
Blinding of personnel (performance bias)	High risk	Blinding of intervention not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinded outcome assessors
Incomplete outcome data (attrition bias) All outcomes	High risk	Differential dropout of 13 from control group, ITT analysis used for data entry by review authors
Selective reporting (reporting bias)	Unclear risk	Outcomes in methods reported
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Low risk	"The study was approved by the Medical Centre Institutional Review Board"
Informed consent	Low risk	"All men provided informed consent"
ITT analysis	Low risk	Assumed from patient flow chart

Marchiori 2010

Methods	RCT
Participants	<p>Time of recruitment: post-operative</p> <p>Population: men with incontinence after retropubic radical prostatectomy, open or laparoscopic</p> <p>Included: moderate to severe incontinence at 30 days after catheter removal</p> <p>Excluded: lack of cooperation, pre-operative incontinence, early recovery of continence</p> <p>Age (mean): A 67; B 66.5</p> <p>Dropouts: "Survey questionnaire were correctly filled in and returned by fewer than 10% of the patients"</p> <p>Baseline characteristics: comparable at baseline</p>
Interventions	<p>Time of intervention: post-operative treatment</p> <p>A (166): one-to-one guided PFMT + biofeedback during first session, second session involved 10 sets of pelvic floor electrical stimulation lasting 15 mins each, instructed to: carry out three sets of 30 contractions a day at home for the first month after catheter removal (16 days after surgery)</p> <p>B (166): received oral and written information on pelvic floor anatomy and on PFME, instructed to: perform three sets of 30 contractions a day at home for the first month</p>

	<p>after catheter removal (16 days after surgery) and continue for duration of</p> <p>All men received oral and written information on pelvic floor anatomy and on PFME, pelvic floor muscle endurance assessed by digital anal control + PFMT consisting of 3 sets of 30 contractions daily for the first month after catheter removal</p> <p>Duration of treatment</p> <p>Follow up: 3 months, 6 months and 12 months</p>	
Outcomes	<p>Primary outcome (number of men with UI)</p> <p>Number of incontinent men (defined as 0 or 2 minipads daily)</p> <p>3 months: A 36/166; B 81/166</p> <p>6.5 months: A 1/166; B 28/166</p> <p>12 months: A 0/166; B 0/166</p> <p>Other outcomes</p> <p>Median time of continence recovery, days:</p> <p>A 44 ± 2, B 76 ± 4, P ≤ 0.01</p> <p>Quality of life</p> <p>ICIQ-male: Results not reported</p> <p>RAND 36-Item Health Survey questionnaire: results not reported</p>	
Notes		
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Prospectively randomized" Sequence generation not reported
Allocation concealment (selection bias)	Unclear risk	"Prospectively randomized"
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	High risk	Not reported for primary outcome
Selective reporting (reporting bias)	High risk	No reporting of primary outcome
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Unclear risk	Not reported. Therefore judged to be unclear risk

Marchiori 2010 (Continued)

ITT analysis	Unclear risk	Not reported. Therefore judged to be unclear risk
--------------	--------------	---

Mariotti 2009

Methods	Randomised: yes
Participants	Randomised post-operatively Included: radical prostatectomy, all men after catheter removal Age: Group A mean 61.86 years, Group B, 61.43 years
Interventions	Intervention post-operative Group A (30) intervention: PFMT plus ES and biofeedback twice a week for 6 weeks ES - a surface electrode was inserted into the anus and pulsed, the intensity was adequate to induce visual lifting of the levator ani and pubococcygeus muscle, considering the level of comfort to the patient Biofeedback - via surface electrodes both perineal and abdominally Group B (30) control: instructions to conduct PFMT - verbal and written instructions at catheter removal and follow-up visits Duration of treatment: 6 weeks Length of follow up: 3 and 6 months
Outcomes	24 hour pad test: g/24hrs, mean (SD) 3 months: A 16.67 (30.55), B 136.67 (152.62), P = 0.000 6 months: A 3.47 (14.67), B 27.83 (55.98), P = 0.0004 ICS-male questionnaire, number of men incontinent, n/N 3 months: A 6/30, B 20/30 6 months: A 1/30, B 10/30 Time to regain continence: A 8 (6.49) weeks, B 13.88 (8.32) weeks, P = 0.003
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Consecutive patients
Allocation concealment (selection bias)	Unclear risk	Quote - "Randomized fashion"
Blinding of participants (performance bias)	High risk	Blinding not possible
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk

Mariotti 2009 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Low risk	No dropouts
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Low risk	“All patients signed an informed consent before randomization”
ITT analysis	Unclear risk	Not specified. Therefore judged to be unclear risk

Martini 2011

Methods	RCT (abstract only)
Participants	<p>Time of recruitment: pre-operative</p> <p>Population: 70 consecutive men undergoing a laparoscopic radical prostatectomy (whole population, with or without UI)</p> <p>Included: men undergoing RP for clinically localized prostate cancer T1 to T3</p> <p>Excluded: history of incontinence or overactive bladder, central or peripheral neurologic disease and cognitive impairment</p> <p>Age (mean, SD): not reported</p> <p>Dropouts: 5 lost to follow up, unclear from which group</p> <p>Baseline characteristics: not reported</p>
Interventions	<p>Time of intervention: pre-operative (post-operative treatment for all men)</p> <p>A (24): PFMT: 5 sessions of guided PFMT for 2 to 3 weeks pre-operatively and continued post-operatively</p> <p>B (25): post-operative standard care, written instructions for PFMT</p> <p>All men underwent clinical examination of pelvic muscles function using digital perineal testing according to “AIPDA score” and evaluation of voiding symptoms</p> <p>Duration of treatment:</p> <p>Follow up: 1, 3 and 6 months</p>
Outcomes	<p>Primary outcome (number of men with UI)</p> <p>Number of incontinent men (need to wear a pad)</p> <p>No useable data</p> <p>Other outcomes</p> <p>24 hour pad test</p> <p>Pad use</p> <p>Bladder diary</p> <p>Quality of life</p> <p>Instrument unspecified</p>
Notes	No useable data

Martini 2011 (Continued)

<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomised"
Allocation concealment (selection bias)	Unclear risk	Not reported. Therefore judged to be unclear risk
Blinding of participants (performance bias)	High risk	Blinding to treatment not possible
Blinding of personnel (performance bias)	Unclear risk	Not reported. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	"Five patients lost at follow up". Not clear why there were drop-outs or from which group
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Unclear risk	Not reported. Therefore judged to be unclear risk
ITT analysis	Unclear risk	Not specified. Therefore judged to be unclear risk

Mathewson-Chapman 97

Methods	Randomised: yes, block procedure Method of allocation: not reported Blinding: none Dropouts: 2, not accounted for Intention to treat: not clear
Participants	Recruitment: pre-operative Included: all men undergoing radical prostatectomy N = 53 men Randomised pre-operatively
Interventions	Pre and post-operative intervention Group A (27) intervention: pre-operatively received further instruction and practice with PME protocol home exercises and biofeedback (anal probe) (Incare 8900); practiced at home 3 times a week, starting with daily 15 PFMT and increasing by 10 every 4 weeks

	<p>to a maximum of 35 PFMT</p> <p>Group B (24) control: post-operatively no further interventions until week 5 when pelvic muscle strength was assessed</p> <p>Both: pre-operatively, both groups received 30 minutes' prostate education programme and baseline 'perineal muscle evaluation' (not defined); as well all were taught to contract the perineal muscle and hold for a few seconds prior to standing, lifting or coughing and limit the amount of tea, chocolate, alcohol and over-the-counter medications</p> <p>Length of follow-up: 12 weeks</p>
Outcomes	<p>Main outcome: urine loss measured by 24 hour pad test, frequency of micturitions (self-recorded bladder diary), number of pads used; days to achieve continence from baseline</p> <p>Secondary outcomes: perineal muscle strength (method not described)</p> <p>Continence definition: self-report of return of continence</p> <p>Data collection: 3 day bladder diaries at weeks 2, 5, 9 and 12. 24 hour pad test at weeks 5 and 12</p>
Notes	<p>Inclusion of other modalities such as caffeine limitation and using perineal muscles during any event which increased abdominal stress may have masked any treatment benefit</p> <p>Extra information obtained from thesis</p>

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Block procedure
Allocation concealment (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Two dropouts
Selective reporting (reporting bias)	Low risk	Outcomes in methods reported
Financial support	Unclear risk	Not reported
Approved by medical ethics committee	Low risk	"Permission to conduct this study was obtained from the University of Florida

Mathewson-Chapman 97 (Continued)

		Health Center Institutional Review Board (IRB).”
Informed consent	Low risk	“The informed consent was explained to each subject, and his signature was obtained to confirm consent to participate in the study”
ITT analysis	Unclear risk	Not specified. Therefore judged to be unclear risk

Moore 1999

Methods	Randomised: yes Method of allocation: sealed envelopes Blinding: physiotherapist blinded to results of control group Dropouts: 5
Participants	Recruitment: post-operative Included: men incontinent post-radical prostatectomy. Median duration of UI 8 weeks post-surgery, range 4 to 200 weeks N = 63 men (53 completed study) Randomised to 3 groups
Interventions	Post-operative intervention Intervention Group A (18) intervention: PFMT alone Group B (19) intervention: PFMT plus rectal electrical stimulation treated by one physiotherapist 30 minutes twice a week for 12 weeks Intervention groups also did home exercises 3 times/day gradually working up to 30 minutes per session lying, standing, sitting; strength, endurance, speed and control with maximum contractions of 5 to 10 seconds, 10 to 20 second relaxation and 12 to 20 repetitions; submaximum contractions at 65% to 75% of maximum strength with hold 20 to 30 seconds and equal rest time, 8 to 10 repetitions; speed was sets of quick repetitive contractions in a 10 second time span; control involved gradual recruitment to maximum contraction in 3 stages with 5 second hold at each stage and a slow release with rest 15 to 30 seconds Group C (21) control: oral and written information about PFMT pre and post-operatively (standard treatment) Length of follow-up: 24 weeks
Outcomes	Main outcome: urine loss measured by 24 hour pad test Secondary outcomes: quality of life measures (Incontinence Impact Questionnaire, European Organization for the research and treatment of Cancer-EORTC QLQ C-30, version 2), physical symptom inventory (adapted from Herr 1994) Continence definition: ≤ 2 g urine/24 hours Data collection: baseline, 12, 16, 24 weeks after baseline

Notes	Intervention perhaps administered too early - all subjects improved at the same rate; wide range of severity of urinary incontinence at study entry and size of SD of pad test results also may have resulted in Type II error	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Participants were assigned using a computer-generated random-number list placed in sealed envelopes at the end of the assessment visit, with patient and researcher opening the sealed envelope"
Allocation concealment (selection bias)	Low risk	"Participants were assigned using a computer-generated random-number list placed in sealed envelopes at the end of the assessment visit, with patient and researcher opening the sealed envelope"
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Low risk	Physiotherapist blinded
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Low risk	5 (3 from group B, 2 from group A), 3 bladder neck contractures, 1 rectal pain when performing exercises, 1 vacation for 4 months). No differential dropout
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	"Funding for the research project was received from the Oncology Nurses' Society, Canadian Nurses' Foundation, Caritas Health, Alberta Physiotherapy Association, Edna Minton Foundation, and the University of Alberta"
Approved by medical ethics committee	Low risk	"approved by the University of Alberta and Caritas Health Group ethics review boards"
Informed consent	Low risk	"All patients signed informed consent"

Moore 1999 (Continued)

ITT analysis	High risk	Intention-to-treat-analysis not performed
--------------	-----------	---

Moore 2004

Methods	<p>Randomised: yes (order of product testing: in threes to treatment block of 4 periods (1 no device, 3 with devices) Block, multiple period cross-over design using Latin square configuration Method of allocation: sealed envelopes. Blinding: research assistant not involved in study chose envelope; but research assistant and participants could not be blinded to intervention Dropouts: none Intention to treat: not discussed</p>	
Participants	<p>Recruitment: post-operative Included: men incontinent post-radical prostatectomy who required continuous pad protection for stress incontinence Inclusion criteria: normal perineal and penile sensation, intact penile skin, sufficient manual dexterity Exclusion criteria: overactive bladder, neurological disorders affecting sensation or circulation, cognitive impairment N = 12 men</p>	
Interventions	<p>Post-operative intervention Each participant had 4 periods (each lasted 1 day) Group A: no device Group B: C3 device Group C: U-TEX device Group D: Cunningham clamp</p>	
Outcomes	<p>Main outcome: 4 hour pad test Secondary outcomes: resistive index, cavernosal flow None of the devices completely eliminated urine loss when applied at a comfortable pressure. Each device showed improvement in terms of urine lost, with Cunningham clamp having the lowest mean loss Cunningham clamp significantly lowered flow, but ranked positively by participants</p>	
Notes	<p>Unable to blind participants and research assistant to intervention Sample size calculation given and required size achieved</p>	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"A computer-generated randomized list of device assignments was prepared by one of the investigators" Block, multiple period crossover design using Latin square configuration

Moore 2004 (Continued)

Allocation concealment (selection bias)	Low risk	Sealed envelopes, research assistant not involved in study chose envelope
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	“A research assistant not directly involved with recruitment or data collection entered the data”
Incomplete outcome data (attrition bias) All outcomes	Low risk	No dropouts
Selective reporting (reporting bias)	Low risk	Outcomes reported
Financial support	Low risk	“This study was supported by the University of Alberta Internal Allocations Fund and Department of Radiology, University of Alberta Hospital.”
Approved by medical ethics committee	Low risk	“The Institutional review Board at the University of Alberta approved the study”
Informed consent	Low risk	“the study was explained and informed consent obtained”
ITT analysis	Unclear risk	Not specified. Therefore judged to be unclear risk

Moore 2008

Methods	<p>Randomised: yes</p> <p>Method of allocation: computer generated list of numbers; group allocation placed in sealed opaque envelopes; opened by subject after initial post-operation instruction session with therapist</p> <p>Blinding: data entry by clerk blinded to group; therapist blinded to outcome of non-intervention group; pads weighed by third party</p> <p>Dropouts: control = 7; treatment = 12</p>
Participants	<p>Recruitment: post-operative (but approached before surgery)</p> <p>Included: men incontinent after radical prostatectomy (> 8 grams urine lost on 24 hour pad test) at 4 weeks post-surgery</p> <p>N = 217 men from 3 centres with early stage prostate cancer</p> <p>Inclusion criteria: English speaking, living within 1 hour drive of research centre</p>

Interventions	<p>Post-operative intervention Group A (106) intervention: maximum 24 weekly, 30 minute treatment protocol (30 min biofeedback-assisted PFMT) and home exercise protocol of 2 to 3 times a day Group B (99) control: verbal and written information on PFME and weekly telephone contact by a urology nurse Both: at 4 weeks post-surgery, both groups received standardised verbal and written instruction about PFMT and recovery after radical prostatectomy by one dedicated physiotherapist or registered nurse at each site Length of follow-up: 12 months</p>	
Outcomes	<p>Main outcome: grams of urine loss on 24 hour pad test (> 8 g defined as incontinence) Definition of continence: < 8 g of urine loss on 24 hour pad test; subjective continence defined as yes or no Secondary outcome: IPSS, IIQ-7 (Incontinence Impact Questionnaire), voiding diary, and subjective continence All measures obtained at baseline (pre-operatively) and at 4, 8, 12, 28 weeks and 1 year post-operatively 24 hour pad test, mean (SD) N 12 weeks: A 115 (300) 93, B 72 (144) 82 16 weeks: A 76 (259) 94, B 61 (194) 80 28 weeks: A 45 (142) 87, B 35 (101) 74 12 months: A 47 (215) 89, B 8 (10) 78 Dry at 8 weeks: A 20/101 (20%), B 20/88 (23%) Dry at 12 weeks: A 30/93 (32%), B 23/82 (28%) Dry at 16 weeks: A 41/94 (44%), B 32/80 (40%) Dry at 28 weeks: A 41/87 (47%), B 37/74 (50%) Dry at 12 months: A 53/89 60%, B 47/78 60% (< 8 g on pad test) No significant differences between groups on continence or on symptom and quality of life measures or diary at any time point post-operatively Cost: A: CAD 400; B 240 Adverse events: none in either group The majority of men reported a low impact of incontinence as per the IIQ-7 and fewer LUTS at 12 months than at baseline on the IPSS. The majority were very satisfied with treatment and support from the continence nurse</p>	
Notes	<p>Groups comparable at pre-operation baseline on PSA, Gleason score, IPPS, IIQ, pad test and voiding diary</p>	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated list of random numbers, random blocked allocation to groups
Allocation concealment (selection bias)	Low risk	Group allocation placed in sealed opaque envelopes; opened by participant after initial post-operation instruction session with

Moore 2008 (Continued)

		therapist
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Low risk	Therapist blinded to outcome of non-intervention group; pads weighed by third party
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Data entry by clerk blinded to group
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Dropouts: control = 7; treatment = 12; no differential dropout
Selective reporting (reporting bias)	Unclear risk	Protocol not available. Therefore judged to be unclear risk
Financial support	Low risk	“Funded by the Alberta Heritage Foundation for Medical Research, the Northern Alberta Urology Foundation, and Pfizer Corporation (unrestricted)”
Approved by medical ethics committee	Low risk	“Healthcare ethics approval was obtained at all sites”
Informed consent	Low risk	“After the consent form was signed, baseline data were collected”
ITT analysis	Low risk	Patient flow chart give details of patient dropouts and withdrawals

Morihiro 2011

Methods	RCT abstract only
Participants	<p>Time of recruitment: not reported</p> <p>Population: men having laparoscopic radical prostatectomy</p> <p>Included: patients who underwent laparoscopic radical prostatectomy performed by a single surgeon</p> <p>Excluded: not reported</p> <p>Age (mean, SD): not reported</p> <p>Dropouts: not reported</p> <p>Baseline characteristics: comparable at baseline</p>
Interventions	<p>Time of intervention: post-operative treatment for all men</p> <p>A (20): PFMT + sacral surface therapeutic ES (ssTES), ssTES 2 times a day for 15 minutes each, lasting 1 month after catheter removal (day 5)</p> <p>B (14): PFMT only, carried out alone</p>

	Duration of treatment: 1 month Follow-up: 1 month, 3 months, 6 months and 12 months post-operatively	
Outcomes	<p>Primary outcome (number of men with UI) Number of incontinent men (defined as requirement for a pad to keep clothing dry) 6 months: A 3/20; B 6/14 12 months: A 0/20; B 5/14</p> <p>Other outcomes Recovery rate of urinary continence (defined as no requirement for a pad to keep clothing dry) 6 months: A 17/20, B 8/14 12 months: A 20/20, B 9/14, P = 0.007</p> <p>Quality of life</p>	
Notes		
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly assigned"
Allocation concealment (selection bias)	Unclear risk	"randomly assigned"
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not enough information. Therefore judged to be unclear risk
Selective reporting (reporting bias)	Unclear risk	Protocol not available. Therefore judged to be unclear risk
Financial support	Low risk	None
Approved by medical ethics committee	Low risk	"ethics committee of Kitasato university of medicine"
Informed consent	Low risk	Yes
ITT analysis	Unclear risk	No description. Therefore judged to be unclear risk

Nowak 2007

Methods	Randomised: yes
Participants	Recruitment: pre-operative Included: men undergoing radical prostatectomy Aged: 59 to 72 years
Interventions	Group A intervention: extra-corporeal magnetic innervation (ExMI) based pelvic floor device Group B control: PFMT alone Treatment initiated one week after catheter removal Duration of treatment: 10 weeks Length of follow-up: 12 months
Outcomes	On first day following catheter removal 16.8% of patients were continent Subsequent follow-up data unclear if N = 105 or 88 subjects. Group numbers not stated UI at - 4 weeks: A 49%, B 56% 3 months: A 36%, B 50% 6 months; A 18%, B 32% Twenty minute pad test at 12 months, significantly better in Group A at 12 months, P =0.004 QoL score and urinary symptom inventory also carried out, numbers not given
Notes	No useable data

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"
Allocation concealment (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	One patient withdrew from Group A for non-medical reasons
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	No description. Therefore judged to be unclear risk

Nowak 2007 (Continued)

Approved by medical ethics committee	Unclear risk	No description. Therefore judged to be unclear risk
Informed consent	Unclear risk	No description. Therefore judged to be unclear risk
ITT analysis	Unclear risk	Not specified. Therefore judged to be unclear risk

Opsomer 1994

Methods	Randomised: yes Method of allocation: method not described Blinding: none Dropouts: 4 Intention to treat: not specified
Participants	Recruitment: post-operative Included: men incontinent post-radical prostatectomy 6 weeks after six week after surgery N = 43 (39 completed study)
Interventions	Post-operative intervention Group A (21) intervention: PFMT plus biofeedback plus ES directed by physiotherapist Group B (22) control: PFME on their own without medical supervision Length of follow-up: 12 weeks
Outcomes	Main outcome: urine loss measured by pad test No statistical difference between groups as to recovery of continence
Notes	Abstract only - unable to contact author for further data

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Allocation concealment (selection bias)	Unclear risk	"Randomised"
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk

Opsomer 1994 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Four dropouts
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	No description. Therefore judged to be unclear risk
Approved by medical ethics committee	Unclear risk	No description. Therefore judged to be unclear risk
Informed consent	Unclear risk	No description. Therefore judged to be unclear risk
ITT analysis	Unclear risk	Not specified. Therefore judged to be unclear risk

Overgard 2008

Methods	Randomised: yes
Participants	Recruitment: Pre-operative Included: radical prostatectomy, all men Age: Group A 48 to 68 years, Group B 49 to 72 years
Interventions	Intervention: post operative Group A (38) intervention: instructions on PFMT and physiotherapy, 45 minutes weekly. Patients were instructed to perform 3 sets of contractions daily at home, in either a supine, sitting or standing position. Digital anal palpation to teach correct contractions, as well as oral and written instructions DVD of instructions given to those living too far from hospital Group B (42) control: instructions on PFMT alone Duration of treatment: up to 1 year Length of follow-up: 3, 6 and 12 months
Outcomes	Self-reported continence (not using pads) 3 months: A 16/35 (46%), B 17/40 (43%), P = 0.73 6 months: A 27/34 (79%), B 22/38 (58%), P = 0.061 12 months: A 33/36 (92%), B 28/39 (72%), P = 0.028 24 hour pad test: g/24hrs, mean (range) 3 months: A 17 (0-282), B 7 (0-46), P = 0.53 6 months: A 9 (0-203), B 2 (0-12), P = 0.73 12 months: A 2 (0-55), B 1 (0-14), P = 0.95 PFM strength (anal squeeze pressure, cm H ₂ O), mean (SD) 3 months: A 50.7 (23.9), B 55.7 (25.6), P = 0.398 6 months: A 56.1 (21.7), B 65.8 (27.0), P = 0.117 12 months: A 64.0 (24.0), B 71.5 (26.2), P = 0.237.

Overgard 2008 (Continued)

Notes	No SDs	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Norwegian University performed the computerised randomisation procedure immediately after pre-operative test
Allocation concealment (selection bias)	Low risk	Norwegian University performed the computerised randomisation procedure immediately after pre-operative test. Urologist no prior knowledge of randomisation procedure
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	High risk	Drop out rate was 6% Four lost to follow up in physiotherapy group, one lost in instructions only group
Selective reporting (reporting bias)	Low risk	Outcomes in methods reported
Financial support	Low risk	"The work was funded by The Norwegian Fund for Postgraduate Training in Physiotherapy and The Norwegian Cancer Society"
Approved by medical ethics committee	Low risk	"The study was approved by the Regional Committee for Medical and Health Research Ethics"
Informed consent	Low risk	"Eighty-five men provided written informed consent"
ITT analysis	Low risk	Assumed from patient flow chart

Parekh 2003

Methods	Randomised: yes Method of allocation: not described Blinding: none Dropouts: 1 from each of the control and treatment groups. Reasons not described Intention to treat: yes, dropouts categorised as incontinent
Participants	Recruitment: pre-operative Included: all men scheduled for radical prostatectomy N = 38 patients with localized carcinoma of the prostate

Interventions	<p>Pre and post-operative interventions</p> <p>Group A (19) intervention: 2 treatment sessions pre-operatively. Session 1 consisted of PFMT in a hook lying position</p> <p>Session 2 was on an exercise ball. Teaching methods varied and included verbal cues, visualization with an anatomical model, palpation or biofeedback with rectal probe. Post-operatively, PFMT was reviewed and participants were seen every 3 weeks for 3 months by a physiotherapist</p> <p>Home exercise for 6 months or more for those requiring further physical therapy guidance</p> <p>Group B (19) control: no formal education on PFMT pre-operatively, telephone or face to face follow-up at least monthly</p> <p>Length of follow-up: 12 months</p>	
Outcomes	<p>Main outcome: urine loss measured by number of pads used daily</p> <p>Continence definition: 0 pads or 1 precautionary pad used</p> <p>Data collection: UI questionnaires at 6, 12, 16, 20, 28, and 52 weeks</p> <p>Greater number of the intervention group gained continence earlier than the control group at 3 months (only point of statistical difference). Minimal long-term effect as continence rates the same at 1 year</p>	
Notes		
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Patients were enrolled in prospective, randomized fashion into a treatment or a control group"
Allocation concealment (selection bias)	Unclear risk	"Randomly assigned"
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	High risk	Blinding to intervention not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Low risk	1 dropout from each arm. Categorised as incontinent
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk

Parekh 2003 (Continued)

Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Unclear risk	Not reported. Therefore judged to be unclear risk
ITT analysis	Unclear risk	Not reported. Therefore judged to be unclear risk

Park 2012

Methods	RCT
Participants	<p>Time of recruitment: post-operative</p> <p>Population: 121 men who underwent radical prostatectomy (whole population, with or without UI)</p> <p>Included: elderly male patients aged ≥ 65 years, clinically localized prostate cancer (cT1 to T2), Eastern Cooperative Oncology Group performance status of 0 or 1, and written informed consent</p> <p>Excluded: adjuvant or neoadjuvant therapy, severe postoperative complications, a history of intrapelvic surgery, diseases that can affect voiding function, and limitations for exercise intervention, such as patients with serious cardiovascular events or spinal or articular disease</p> <p>Age (mean, SD): A 69.1 (5.7); B 69.4 (7.2)</p> <p>Dropouts: A: 7 (1 orthopaedic surgery for a pre-existing ankle problem, 1 transurethral surgery for urethral stricture, 4 non-compliance with follow-up due to a long distance from the centre to the home or personal affairs, 1 new employment after surgery) B: 8 (1 ophthalmologic surgery for a cataract, 2 adjuvant radiotherapy, 4 non-compliance with follow-up due to a long distance from the center to the home or personal affairs, 1 new employment after surgery)</p> <p>Not differential dropout</p> <p>Baseline characteristics: comparable at baseline</p>
Interventions	<p>Time of intervention: post-operative treatment for all men</p> <p>A (26): patients performed Kegel exercises twice weekly, together with other types of exercises which included resistance training and pelvic flexibility. The intervention started 3 weeks after surgery and lasted 12 weeks</p> <p>B (23): 'In the control group, only kegel exercises were performed'</p> <p>Duration of treatment: 15 weeks</p> <p>Follow-up: 1 week before surgery, 3 weeks and 15 weeks after surgery</p>
Outcomes	<p>Primary outcome (number of men with UI)</p> <p>Cumulative number of incontinent men [defined as > 1 g on 24 hour pad test] 15 weeks: A 7/26; B 13/23</p> <p>Other outcomes</p> <p>Cumulative number of continent men [defined as < 1 g on 24 hour pad test] 15 weeks: A 19/26; B 10/23, P = 0.035</p> <p>Urine loss in grams using 24 hour pad test (mean (SD) N)</p>

	<p>1 week before surgery: A 0 (NR) 26; B 0 (NR) 23 3 weeks post-operatively: A 60 (NR) 26; B 83 (NR) 23 15 weeks: A 12 (NR) 26; B 46 (NR) 23</p> <p>Quality of life</p> <p>ICIQ score (mean (SD) N) 1 week before surgery: A 4 (NR) 26; B 3 (NR) 23 3 weeks post-operatively: A 10 (NR) 26; B 10 (NR) 23 15 weeks: A 6 (NR) 26; B 10 (NR) 23</p> <p>SF-36 physical composite score (mean (SD) N) 1 week before surgery: A 57 (NR) 26; B 54 (NR) 23 3 weeks post-operatively: A 45 (NR) 26; B 44 (NR) 23 15 weeks: A 57 (NR) 26; B 48 (NR) 23</p> <p>SF-36 mental composite score (mean (SD) N) 1 week before surgery: A 45 (NR) 26; B 44.6 (NR) 23 3 weeks post-operatively: A 44 (NR) 26; B 43 (NR) 23 15 weeks: A 49 (NR) 26; B 46 (NR) 23</p> <p>Beck Depression Inventory (mean (SD) N) 1 week before surgery: A 9 (NR) 26; B 7.4 (NR) 23 3 weeks post-operatively: A 8 (NR) 26; B 9 (NR) 23 15 weeks: A 6 (NR) 26; B 9 (NR) 23 NR = Not reported</p>
Notes	<p>Details of the combined exercise regime</p> <p>Post-operative weeks 1 to 4</p> <ol style="list-style-type: none"> 1) Education about post-operative symptoms 2) Performing Kegel exercises, recognizing the parapelvic muscles 3) Pelvic floor flexibility fitness: performing pelvic exercises while sitting on a ball <p>Post-operative weeks 5 to 8 (ball exercises)</p> <ol style="list-style-type: none"> 1) Performing pelvic exercises while sitting on a ball 2) Performing lower extremity exercises while placing a ball on the wall 3) Lifting a heel on the ball while standing face-to-face with the wall 4) Lifting up and down on the ball while spreading and bending legs 5) Performing flank exercises while having a ball in the hand 6) Squeezing the ball with the adductor muscles while lying on a table <p>Post-operative weeks 9-12 (elastic band exercises)</p> <ol style="list-style-type: none"> 1) Lifting the object with an elastic band lateral, anterior, and posterior to the patient's arms 2) Lifting the legs and then spreading them while attaching an elastic band to the foot <p>Further information provided by author</p>
Risk of bias	
Bias	Authors' judgement Support for judgement
Random sequence generation (selection bias)	Low risk "A random number generator was used to determine the randomization allocation in a 1:1 ratio"

Park 2012 (Continued)

Allocation concealment (selection bias)	Low risk	“Sealed envelope, sequentially numbered, and opened by the trial nurse”
Blinding of participants (performance bias)	High risk	Blinding of participants was not possible
Blinding of personnel (performance bias)	High risk	Blinding not possible
Blinding of outcome assessment (detection bias) All outcomes	Low risk	An independent assessor performed serial measurements
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	A: 7 (1 orthopaedic surgery for a pre-existing ankle problem, 1 transurethral surgery for urethral stricture, 4 non-compliance with follow-up due to a long distance from the centre to the home or personal affairs, 1 new employment after surgery) B: 8 (1 ophthalmologic surgery for a cataract, 2 adjuvant radiotherapy, 4 non-compliance with follow up due to a long distance from the center to the home or personal affairs, 1 new employment after surgery) No differential dropout
Selective reporting (reporting bias)	Low risk	Results of outcomes reported
Financial support	Low risk	Unconditional funding from the “Medical Research Institute, Pusan National University Hospital, Busan, Korea.”
Approved by medical ethics committee	Low risk	“Our institutional review board approved this prospective, randomized, controlled trial”
Informed consent	Low risk	Patients signed “written informed consent”
ITT analysis	High risk	No

Perissinotto 2008

Methods	Randomised: yes. Method of allocation: consecutive patients
Participants	Pre-operative randomisation Included: all men undergoing radical prostatectomy Pre-operative intervention Age: not given
Interventions	Group A (N not given) intervention: early pelvic floor rehabilitation program at home twice dally, Kegel exercises Group B (N not given) control: no formal PFMT Duration of treatment: for six months or until continence was achieved Length of follow-up: at 3 and 6 months

Outcomes	PFM strength: P = 0.002 Quality of life using ICIQ-SF not significant 24 hour pad test not significant	
Notes	No useable data	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Consecutive patients. No additional information provided. Therefore judged to be unclear risk
Allocation concealment (selection bias)	Unclear risk	Randomised controlled trial. No additional information provided. Therefore judged to be unclear risk
Blinding of participants (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	"FAPESP" (Sao Paulo Research Foundation)
Approved by medical ethics committee	Low risk	"COMITE DE ESTICA E PESQUISA - UNICAMP"
Informed consent	Low risk	Yes
ITT analysis	Unclear risk	Not specified

Porru 2001

Methods	<p>Randomised: yes Method of allocation: not described Blinding: report stated that urologist performing digital evaluation of pelvic floor muscle contraction was blinded to the study group Dropouts: intervention 2, control 1. Reason reported was non-attendance at all clinic appointments Intention to treat: none</p>	
Participants	<p>Recruitment: pre-operative Included: all men undergoing TURP N = 58 men (55 completed study) with benign prostatic hypertrophy randomised to 2 groups</p>	
Interventions	<p>Pre and post-operative intervention Group A (30) intervention: initial visit before surgery, digital evaluation of pelvic muscle contraction strength. Verbal instruction, feedback and reinforcement on contraction was given to teach selective contraction of anal sphincter and relaxation of abdominal muscles. Verbal and written instruction given for home PFMT. Weekly digital anal reassessment and grading of pelvic muscle contraction by the therapist. Instructed to practice contractions 45 times per day (3 groups of 15 contractions) Group B (28) control: not specified Both A and B: voiding diaries initiated after catheter removal Length of follow-up: 4 weeks. Data collection at catheter removal and weekly for 4 weeks</p>	
Outcomes	<p>Main outcome: urine loss (incontinence episodes) measured by 48 hour bladder diaries completed weekly Secondary outcomes Muscle contraction strength by digital evaluation Scale 0 to 4 (0 = none, 4 = strong) Pressure flow: urine flowmetry pre-operatively and 1 month post-operatively Symptoms: AUA (American Urological Association) symptom score preoperatively and 30 days after surgery Quality of life: ICS male questionnaire Significant increase in muscle strength in intervention group by week 4 Both groups showed improvement in symptom score and quality of life post-operatively, no significant difference between groups Significantly better satisfaction with life in intervention group A compared to control B at 4 weeks Significant difference in voiding intervals between the groups at weeks 2 and 3, but not week 4 No difference in uroflowmetry Significantly less incontinence in the intervention group A at weeks 1, 2 and 3. No difference at week 4 Concluded that PFMT quickens the return to normal voiding post-TURP</p>	
Notes		
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement

Porru 2001 (Continued)

Random sequence generation (selection bias)	Unclear risk	No description
Allocation concealment (selection bias)	Unclear risk	B - 'randomised'
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Low risk	Urologist performing digital evaluation of pelvic floor muscle contraction was blinded to the study group
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	"One urologist, who was blinded to the study group of the patients, performed only the digital evaluation of the pelvic floor muscle contraction and established and reported the grading during all the visits"
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Dropouts due to non-attendance at all clinic appointments (A 2, B 1)
Selective reporting (reporting bias)	Low risk	Results reported for outcomes stated in methods
Financial support	Unclear risk	No description. Therefore judged to be unclear risk
Approved by medical ethics committee	Unclear risk	No description. Therefore judged to be unclear risk
Informed consent	Low risk	"Informed consent was given by all patients"
ITT analysis	Unclear risk	Not specified

Ribeiro 2008

Methods	Randomised: yes
Participants	Post-operative intervention Included: radical prostatectomy, all men after catheter removal Age: 51 to 76 years
Interventions	Group A (36) intervention: PFMT plus BF weekly for 3 months Group B (37) control: PFMT oral instructions only Duration of treatment: weekly until continent or to a maximum of 3 months Length of follow-up: 3 months after treatment finished

Outcomes	<p>UI severity (24 hour pad test weights) 1 month (N, mean, SD): A 96 g (160) 36, B 355 (423) 37, P = 0.007 3 months: A 51 (119), 36, B 197 (269) 37 6 months: A 40 (77), 36, B 80 (176) 37 ICI-SF score: 3 months: A 3.4 (3.7), 36, B 6.8 (5.6) 37, P = 0.022 6 months: A 2.7 (3.5), 36, B 4.3 (5.5) 37, P = 0.339 PFM Strength, A versus B: 1 month, P = 0.006; 3 months P < 0.001; 6 months P = 0.799 Quality of life (IIQ): 3 months: A 1.6 (2.7), 36, B 4.3 (6.2) 37</p>	
Notes	Groups comparable at baseline before operation on age, BMI, voiding symptoms and PFMT strength	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Allocation concealment (selection bias)	Unclear risk	"Randomised controlled trial"
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	High risk	Blinding not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Low risk	19: A:10 (2 refused further follow-up, 7 post-operative complications, 1 radiotherapy); B: 9 (6 refused further follow-up, 2 post-operative complications, 1 radiotherapy). No differential dropout
Selective reporting (reporting bias)	Low risk	Outcomes in methods reported
Financial support	Low risk	Grant FAPESP 2003/07656-7 (Sao Paulo Research Foundation)
Approved by medical ethics committee	Low risk	"institutional review board approval"
Informed consent	Low risk	"All patients signed an informed consent before randomization"
ITT analysis	Low risk	Assumed from patient flow chart

Robinson 2008

Methods	Randomisation: yes
Participants	Recruitment: pre-operatively Included: all men undergoing radical prostatectomy Groups comparable at baseline Age range 39 to 74 years Pre-operative UI 9%
Interventions	Group A (62) intervention: brief verbal instruction in PFMT before operation and offer of one biofeedback session at 2 months after surgery (uptake 33%) plus PFMT for four weeks with biofeedback Group B (64) control: brief verbal instruction in PFMT before operation and offer of one biofeedback session at 2 months after surgery (uptake 46%)
Outcomes	No urinary outcomes provided No between group differences in intensity and distress of lower urinary tract symptoms nor in impact on health-related quality of life
Notes	No useable data

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated randomisation list
Allocation concealment (selection bias)	Low risk	The co-project director who supervised the intervention was responsible for recruitment, but did not have access to the randomisation list The co-project director who supervised data collection was responsible for concealment of the randomisation list and allocation to the next available assignment on the list to participants sequentially as they enrolled
Blinding of participants (performance bias)	High risk	Participants were advised by the research assistant of their group assignment
Blinding of personnel (performance bias)	High risk	Questionnaires were filled in by research assistants either in person or by telephone interview
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Low risk	No significant difference between groups in the number of participants who either withdrew prematurely or were dropped from the study. Questionnaires with > 20% data missing were excluded from analysis. In remainder mean substitution was in-

Robinson 2008 (Continued)

		putted for missing data
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	“This study was supported by the American Cancer Society (TPRB-98-118-01-PBP) and a Rutgers College of Nursing Faculty Research Development Award”
Approved by medical ethics committee	Low risk	“Recruitment was initiated in January 1998 after approval of the parent study was obtained from the institutional review boards of both medical centres and the university”
Informed consent	Low risk	“Written informed consent was obtained by a research assistant”
ITT analysis	Low risk	“Data analysis was by intention-to-treat”

Robinson 2009

Methods	Randomisation: randomly assigned via sealed envelopes	
Participants	Number of men 54 but no numbers in groups Recruitment: post-operatively Included: radical prostatectomy, all with UI who were 50 + years, English speaking and were within a 50 mile radius of treatment centre Age: mean 59.5 (6.3) years	
Interventions	Group A intervention: routine brief verbal and written PFMT plus one PFMT session and 3 weekly nurse phone calls Group B intervention: routine brief verbal and written PFMT plus four BF enhanced PFMT sessions and 4 weekly nurse phone calls Group C control: routine brief verbal and written PFMT Duration of treatment: 3 months Length of follow-up: 9 months	
Outcomes	Urine stream interruption test (PFM strength) Mishell Uncertainty in Illness Scale Broome Pelvic Muscle self-Efficacy Scale UI frequency (3 day bladder diary) 24 hour pad test (volume of urine lost) Male Urogenital Distress Inventory (UI distress) Male Urinary Symptom Impact Questionnaire (QoL)	
Notes	No useable data in abstract	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement

Robinson 2009 (Continued)

Random sequence generation (selection bias)	Low risk	Via sealed envelopes
Allocation concealment (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	“NIH/NINR”
Approved by medical ethics committee	Low risk	“Yes”
Informed consent	Low risk	“Following informed consent”
ITT analysis	Unclear risk	Not specified. Therefore judged to be unclear risk

Seleme 2008

Methods	Randomisation: yes, single blind Method of allocation: using coloured cards
Participants	Post-operative intervention Included: men with UI eight weeks after radical prostatectomy Exclusion: previous radiotherapy, anterior transurethral resection, diabetes mellitus and urethral obstruction after surgery Age: median 63.7 years, range 46 to 83 years
Interventions	A (44) intervention: verbal instruction and information on PFMT plus information on life style changes. Additional 15 physiotherapy sessions consisting of intensive PFMT with BF and ES B (32) control: verbal instruction and information on PFMT plus information on life style changes Duration of treatment: no description Length of follow-up: 6 months

Outcomes	Incontinence Quality of life (I-QoL, higher score better), mean (SD) Directly after treatment: A 44.23 (14.61), B 37.53 (9.94) At 6 months: A 80.32 (7.01), B 51.69 (16.17), P = 0.001 At 6 months for Group A (44) intervention only: 1 hour pad test: mean urine loss before treatment 54.2 g and after treatment 8.8 g (P > 0.001) VAS severity of UI: before treatment 9.3, after treatment 1.3 (P > 0.001)	
Notes	Unexplained disparity between numbers in randomised groups No results for Group B control for pad test or VAS	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Coloured cards
Allocation concealment (selection bias)	Unclear risk	Method of selection unknown
Blinding of participants (performance bias)	High risk	Blinding not possible
Blinding of personnel (performance bias)	High risk	Blinding not possible
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	High risk	No information for Group B control for both the one hour pad test and the VAS severity of UI
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	"None"
Approved by medical ethics committee	Low risk	"Medical Ethical Committee of Nossa Senhora das Gracas Hospital in Curitiba, Brazil"
Informed consent	Low risk	"after signing informed consent"
ITT analysis	Unclear risk	Not reported. Therefore judged to be unclear risk

Tibaek 2007

Methods	<p>Randomisation: yes, mathematical table, grouped in blocks of 10</p> <p>Method of allocation: sealed envelopes by independent third party</p> <p>Blinding: Single blind. Independent physiotherapist undertook initial assessment and 4 week outcome assessment</p> <p>Dropouts: 9 before intervention (4, training too time consuming; 1, didn't have TURP; 4, operated elsewhere)</p> <p>Setting: Hospital, Denmark</p>
Participants	<p>Pre-operative intervention</p> <p>Included: TURP, all men</p> <p>Exclusion: prostate cancer, previous lower urinary tract surgery, neurological disease</p> <p>Age: A 70 (58 to 77) years, B 68 (52 to 79) years</p>
Interventions	<p>Group A (26) intervention: 1 hour individual session with physiotherapist to teach correct contraction for PFMT, three 1 hour group lessons and home training programme</p> <p>Group B (23) control: no pre-operative physiotherapy. Information about anatomy and physiology and verbal instructions for 2 to 3 days after TURP in the ward</p> <p>Duration of treatment: 4 weeks after surgery</p> <p>Length of follow-up: 2 and 4 weeks and 3 months after operation</p>
Outcomes	<p>Compliance: A 24/26 attended all 4 training sessions</p> <p>Use of urinary pads per 24 hours, at 4 weeks: A 4/26, B 4/21. At 3 months: A 3/26, B 5/22</p> <p>UI (pad test weight g/24hrs):</p> <p>4 weeks (N, Median, range): A 26, 12 (0 to 374), B 23, 4 (0 to 56), P = 0.755</p> <p>Danish Prostatic Symptom Scale: 3 months (N, median, range): A 26, 3 (0 to 24), B 23, 4.5 (0 to 51), P = 0.754</p> <p>Also data on muscle function, muscle strength, static endurance and dynamic endurance</p>

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Mathematical table, grouped in blocks of 10
Allocation concealment (selection bias)	Low risk	Sealed envelopes by independent third party
Blinding of participants (performance bias)	High risk	Not possible to blind to intervention
Blinding of personnel (performance bias)	Unclear risk	Independent physiotherapist undertook initial assessment and 4 week outcome assessment

Tiback 2007 (Continued)

Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	High risk	Nine dropped out before intervention
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	None
Approved by medical ethics committee	Low risk	“This study was approved by the ethical committee in Copenhagen County and followed the Declaration of Helsinki”
Informed consent	Low risk	“Informed consent was obtained from the patients”
ITT analysis	Unclear risk	Not specified

Tienforti 2012

Methods	RCT
Participants	<p>Time of recruitment: pre-operative</p> <p>Population: men undergoing radical prostatectomy (whole population, with or without UI)</p> <p>Included: men who underwent open retropubic radical prostatectomy for clinically localized prostate cancer (cT1a to cT2b), able to regularly attend an ambulatory schedule</p> <p>Excluded: prior diseases with a possible impact on urinary continence, preoperative radiotherapy and any medical condition that could limit participation in the training programme</p> <p>Age (mean, range): A 67 (60 to 74); B 64 (52 to 74)</p> <p>Dropouts: 1 from A (intolerance to procedure using rectal probe), 1 from B (surgical complication)</p> <p>Not differential dropout</p> <p>Baseline characteristics: comparable at baseline</p>
Interventions	<p>Time of intervention: pre-operative</p> <p>A (16): on the day before RP + the day after catheter removal, patients received guided PFMT + biofeedback + information about the anatomy of pelvic floor muscles and wrong execution was corrected, also given oral and written instructions on Kegel exercises to be performed at home, instructed to: perform three sets daily for 10 mins, each contraction lasting 5 seconds with 5 seconds of relaxation, contract their pelvic floor while lying, sitting and standing, frequency recorded in training diary, After RP visits at monthly intervals after catheter removal involving assisted biofeedback and motivation for 20 min</p> <p>B (16): after catheter removal, men received standard care, oral and written instructions from urologist on PFMT, Instructed to: start PFMT (e.g. 2 to 3 weeks after surgery),</p>

	<p>control visits at 3 + 6 months after catheter removal All men were given oral and written instructions post-operatively to perform PFMT at home, 3 sets daily of 10 min each Duration of treatment: monthly visits as long as patient required pads, including safety pads Follow up: at least 6 months after catheter removal</p>	
Outcomes	<p>Primary outcome (number of men with UI) Number of incontinent men (defined as ICIQ-UI > 0) 1 month: A 10/16; B 16/16, P = 0.02 3 months: A 8/16; B 15/16, P = 0.01 6 months: A 6/16; B 15/16, P = 0.002</p> <p>Other outcomes Number of continent men (efined as ICIQ-UI = 0) 1 month: A 6/16; B 0/16, P = 0.02 3 months: A 8/16; B 1/16, P = 0.01 6 months : A 10/16; B 1/16, P = 0.002</p> <p>Mean number of incontinence episodes per week/24 hours (mean (SD) N) 1 month: A 1.43 (0.82) 16; B 14 (0.82) 16, P = N.S 3 months: A 0.57 (1.47) 16; B 2 (1.47) 16, P = 0.01 6 months: A 0.43 (1.33) 16; B 1.86 (1.33) 16, P = 0.005</p> <p>Mean number of pads used per week/24 hours (mean (SD) N) 1 month: A 0.46 (0.67) 16; B 0.94 (0.67) 16 P = NS 3 months: A 0.23 (0.63) 16; B 0.91 (0.63) 16 P = 0.005 6 months: A 0.2 (0.57) 16; B 0.66 (0.57) 16 P = 0.03</p> <p>Quality of life Mean ICIQ-OAB score (mean (SD) N) 1 month: A 11.5 (3.6) 16; B 14 (3.6) 16, P = NS 3 months: A 11 (0.92) 16; B 11.7 (0.92) 16, P = 0.04 6 months: A 9 (4.1) 16; B 13 (4.1) 16, P = 0.01</p> <p>Mean UCLA-PCI score (mean (SD) N) 1 month: A 330 (?) 16; B 260 (?) 16, P = NS 3 months: A 400 (500) 16; B 270 (338) 16, P = 0.006 6 months: A 430 (487) 26; B 275 (311) 16, P = 0.003</p>	
Notes		
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Generated by computer and was stratified with a 1:1 allocation"
Allocation concealment (selection bias)	Unclear risk	Not reported

Tienforti 2012 (Continued)

Blinding of participants (performance bias)	High risk	“Participants were unblinded to treatment assignment”
Blinding of personnel (performance bias)	Low risk	“Surgeons and person scoring the evaluation questionnaires were blinded throughout the duration of the study”
Blinding of outcome assessment (detection bias) All outcomes	Low risk	“nurse scoring the evaluation questionnaires was blinded” to randomisation
Incomplete outcome data (attrition bias) All outcomes	Low risk	1 from A (intolerance to procedure) 1 from B (surgical complication). Not differential dropout
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported
Approved by medical ethics committee	Low risk	“Work was carried out in accordance with the ethical standards of the appropriate institutional committee on human experimentation and with the last revision of the Helsinki Declaration
Informed consent	Low risk	“All eligible patients gave informed signed consent”
ITT analysis	Low risk	Assumed from patient flow diagram

Tobia 2008

Methods	Randomised: yes	
Participants	Recruitment: pre-operative Included: all men, radical prostatectomy Age: 45 to 75 years	
Interventions	Group A (19) intervention: PFMT Group B (19) control: no PFMT length of follow-up: 2, 4 and 8 weeks	
Outcomes	Dry at 2 weeks: A 9/19, B 9/19 Dry at 4 weeks: A 9/19, B 9/19 Dry at 8 weeks: A 15/19, B 17/19, P = 0.374 No significant differences for age (P = 0.674), PSA (P = 0.208), Gleason score pre (P = 0.762) and post-operation (P = 0.824)	
Notes	Awaiting translation for more information.	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement

Tobia 2008 (Continued)

Random sequence generation (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Allocation concealment (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of participants (performance bias)	High risk	No description, Spanish language
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Low risk	No dropouts. Therefore judged to be unclear risk
Selective reporting (reporting bias)	Unclear risk	Spanish language
Financial support	Unclear risk	Unable to be determined
Approved by medical ethics committee	Unclear risk	Unable to be determined
Informed consent	Unclear risk	Unable to be determined
ITT analysis	Unclear risk	Unable to be determined

van Kampen 1998

Methods	<p>Randomised: yes</p> <p>Method of allocation: stratified randomisation with sealed envelopes. Stratified by grams of urine loss (< 50 , > 50, < 250, > 250 g)</p> <p>Blinding: yes (outcome assessor not involved with the study)</p> <p>Dropouts: 5</p> <p>Intention to treat: yes</p>
Participants	<p>Recruitment: post-operative</p> <p>Included: men incontinent post-radical prostatectomy 15 days after surgery after catheter removal</p> <p>N = 102 eligible, 98 completed</p>
Interventions	<p>Post-operative intervention</p> <p>Group A (50) intervention: 1 session of PFMT in hospital before discharge and then saw the physiotherapist for 1 to 2 weeks for as long as UI persisted; 90 daily home exercises sitting, standing and lying; 7 men unable to contract PFM or with weak contraction received electrical stimulation by anal probe</p> <p>Group B (52) control: No formal PFMT instruction but saw the therapist at 1 to 2 weeks and received placebo stimulation and information about aetiology of UI</p>

van Kampen 1998 (Continued)

	Both A and B: received bladder training to increase bladder capacity Length of follow-up: 12 months	
Outcomes	Main outcome: urine loss measured by 24 and 1 hour pad tests; 24 hour pad test done daily until continence achieved; 1 hour pad test when loss of < 2 g of urine to confirm continence Secondary outcomes: Subjective UI by visual analogue scale Fluid Volume Chart Quality of Life - questionnaire designed for study Continence definition: Numbers cured defined as < 2 g urine loss on 24 and 1 hour pad tests Data collection: subject assessment of continence preoperatively (during screening), and at 1, 6 and 12 months. Daily weighing of pads by participants (24 hour pad test)	
Notes	Pragmatic study; policy of management left to clinical judgment as to which protocols to add to PFMT regime. 63 of the eligible subjects were unable to participate because of geographical reasons; demographics and post-operative variables did not differ from the 102 subjects who were in the treatment groups	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Stratified by grams of urine loss (< 50 , > 50, < 250, > 250 g)
Allocation concealment (selection bias)	Low risk	A - stratified randomisation with sealed envelopes
Blinding of participants (performance bias)	Unclear risk	The control group "received placebo electrotherapy that could not affect the pelvic-floor muscle function."
Blinding of personnel (performance bias)	Unclear risk	"The patients in both groups were treated by the same therapist (MVK) until they became continent, within a period of 1 year"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Outcome assessor not involved with the study
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Dropouts: 5
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	"supported by a grant from the Fund of Scientific Research, Flanders, Belgium"

van Kampen 1998 (Continued)

Approved by medical ethics committee	Unclear risk	Not specified
Informed consent	Low risk	“All patients included in the study gave written informed consent”
ITT analysis	Low risk	“The groups were analysed on an intention-to-treat basis”

Wille 2003

Methods	<p>Randomised: yes</p> <p>Method of allocation: not described</p> <p>Blinding: not mentioned</p> <p>Dropouts: numbers participating at 3 and 12 months identified (for pad test, N = 116 at baseline, 79 at 3 months and 124 at 12 months), reason for dropouts not described</p>
Participants	<p>Recruitment: pre-operative</p> <p>Included: all men undergoing radical prostatectomy</p> <p>N = 139 randomised (number in each group at various data collection points varied)</p>
Interventions	<p>Post-operative intervention</p> <p>Group A (47): PFMT alone</p> <p>Group B (46): PFMT + ES; PFMT as above plus instructed by dedicated in ES via surface anal electrode and bio-impulser (biphasic pulse with 1 second bursts, 5 second pulse width, 2 second pulse trains</p> <p>Group C (46): PFMT + ES + biofeedback. As above plus biofeedback (anal probe) 15 minutes twice daily for 3 months</p> <p>All groups A and B and C: PFMT by physiotherapist, 20-30 minute sessions for 3 days, instructed to perform exercises twice daily for 3 months plus 3 week rehabilitation program after discharge. Regular interaction with health professional for 6 weeks after surgery, encouraged to performed treatment for 3 months post-surgery</p> <p>Length of follow-up: 12 months</p>
Outcomes	<p>Main outcome: urine loss measure by continence questionnaire and 20 minute provocative pad test</p> <p>Continence definition: reported use of 0 to 1 pads on questionnaire (subjective) or loss of less than 1 gram of urine on pad test</p> <p>Data collection: baseline (after catheter removal), 3 months and 12 months post-operatively</p> <p>Willingness to undergo surgery again: A 73%, B 83%, C 73%</p> <p>Quality of life EORCT QLQ-C30: scores for physical; role; emotional; social; and global quality of life were not significantly different between the groups at 3 or 12 months (no SDs provided)</p> <p>No significant differences in continence rates between the three groups at baseline, 3 months or 12 months (objective)</p>
Notes	

<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Prospective randomized trial" Method of sequence generation not specified
Allocation concealment (selection bias)	Unclear risk	"Prospective randomized trial" Method of sequence generation not specified
Blinding of participants (performance bias)	High risk	Blinding to intervention not possible
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported
Incomplete outcome data (attrition bias) All outcomes	High risk	"Results at baseline after catheter removal, at 3 and 12 months postoperatively were available for 139, 120 and 128 (questionnaires at three different time points) and 116, 79 and 124 (pad test at three different time points) patients, respectively". However, no information about individual groups
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Unclear risk	Not reported. Therefore judged to be unclear risk
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Low risk	"Informed consent was obtained"
ITT analysis	Unclear risk	Not reported. Therefore judged to be unclear risk

Yamanishi 2006

Methods	<p>Randomised: yes.</p> <p>Blinding: double blind</p> <p>Dropouts: 1 due to pain in the intervention group</p>
Participants	<p>Randomisation: postoperative</p> <p>Included: radical prostatectomy, all with severe post-operative UI of > 100 g after catheter removal</p> <p>Age: mean 65.7 (7.0) years</p> <p>Pre-operative intervention</p>
Interventions	<p>All patients instructed pre-operatively PFMT by nurses and continued after catheter removal</p> <p>A (26) intervention: oral PFMT plus electrical stimulation for 15 minutes twice daily (50 Hz square waves, 300 µsec pulse duration, maximum output 70 mA (5 sec on, 5 sec off duty cycle)</p> <p>B (30) control: oral PFMT plus sham stimulation (output 3 mA, 2 sec on, 13 sec off duty cycle)</p> <p>Duration of treatment: until continent or 12 months</p> <p>Length of follow-up: 1, 3, 6 and 12 months after treatment</p> <p>Dropouts: A 4/26, B 5/30 (including 2+4 with adverse effects)</p>
Outcomes	<p>Number of incontinent men</p> <p>1 month: A 18/26, B 29/30</p> <p>3 months: A 10/24, B 25/29</p> <p>6 months: A 5/23, B 15/26</p> <p>12 months: A 3/22, B 8/25</p> <p>24 hour pad test weights (mean ml, SD, N)</p> <p>1 month: A 210 (261) 26, B 423 (357) 30</p> <p>3 months: A 81 (140) 24, B 232 (339) 29</p> <p>6 months: A 20 (49) 23, B 132 (293) 26</p> <p>12 months: A 18 (49) 22, B 98 (277) 25</p> <p>Time until continent in months (mean, SD, N): A 2.71 (2.6) 22, B 6.82 (3.9) 25, P = 0.0006</p> <p>ICIQ-SF (mean score SD N; 0 to 21, higher = worse)</p> <p>1 month: A 10.6 (6) 26, B 14.9 (4.9) 30</p> <p>3 months: A 5.8 (5.7) 24, B 11.2 (5.7) 29</p> <p>6 months: A 4.3 (6.2) 23, B 8.2 (5.3) 26</p> <p>12 months: A 4.2 (6.2) 22, B 5.6 (6.5) 25</p> <p>ICIQ-QoL score (mean score SD N; 0 to 21; 0 to 10, higher = worse)</p> <p>1 month: A 4.2 (3.5) 26, B 6 (3) 30</p> <p>3 months: A 2.2 (2.3) 24, B 3.7 (2.9) 29</p> <p>6 months: A 1.6 (3.1) 23, B 2.5 (2.2) 26</p> <p>12 months: A 1.5 (3.1) 22, B 1.9 (2.5) 25</p> <p>Adverse effects: A 2/26, B 4/30 (discomfort or anal pain)</p>
Notes	
<i>Risk of bias</i>	

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	By computer
Allocation concealment (selection bias)	Low risk	"None of the patients, doctors or medical staff knew which type of stimulation had been assigned until the key code was opened"
Blinding of participants (performance bias)	Low risk	Men were blinded to the intervention (sham, low energy stimulation in control group)
Blinding of personnel (performance bias)	Low risk	Blinding of doctors, nurses and medical staff
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Blinding of assessors, medical staff
Incomplete outcome data (attrition bias) All outcomes	Low risk	It is reported that "In the active ES group 2 patients discontinued after 2 and 3 months, respectively, due to urethral stricture at the bladder neck. In the sham group 1 patient discontinued treatment at 7 months because of an increase in prostate specific antigen and he then underwent radiation therapy". However, there is no evidence that dropout was related to trial interventions
Selective reporting (reporting bias)	Unclear risk	Protocol not available
Financial support	Low risk	"None"
Approved by medical ethics committee	Low risk	"Local ethical committee approval" was obtained
Informed consent	Low risk	"written informed consent from each subject was obtained"
ITT analysis	Unclear risk	Not reported. Therefore judged to be unclear risk

Yokoyama 2004

Methods	Randomised: yes Method of allocation: not stated Blinding: not mentioned Dropouts: it appears that there are no dropouts but this is not specifically mentioned
Participants	Recruitment: post-operative Included: 36 men with urinary incontinence, >100g on 24hour pad test, one day after catheter removal Mean age: Group A 67.2 years, Group B 68.2 years, Group C 66.2 years
Interventions	A (12) intervention: anal electrode for 15 minutes twice a day for 1 month B (12) intervention: extra-corporeal magnetic innervation, neocontrol system, treatment sessions 20 minutes, twice a week for 2 weeks C (12) control: PFMT, digital anal teaching of correct contractions, then verbal and written instructions for home practice Length of follow-up: 2, 3, 4, 5 and 6 months
Outcomes	24 hour pad test weight (grams) 3 months: A 34 g, B 7.3 g, C 50 g. 6 months: for all groups less than 10 g Quality of life measured by I-QOL: improvement in all groups over time, no statistically significant difference between the groups Remaining UI at 6 months: A 2/12, B 1/12, C 2/12
Notes	Adverse effects: None in any of the groups, no discomfort or irritation from anal probe

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk
Allocation concealment (selection bias)	Unclear risk	Randomly assigned
Blinding of participants (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of personnel (performance bias)	Unclear risk	No description. Therefore judged to be unclear risk
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No description. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Numbers not given
Selective reporting (reporting bias)	Unclear risk	Protocol not available

Yokoyama 2004 (Continued)

Financial support	Unclear risk	Not reported
Approved by medical ethics committee	Low risk	“The local ethics committee approved the protocol procedure”
Informed consent	Low risk	“Each patient provided written informed consent”
ITT analysis	Unclear risk	Not reported. Therefore judged to be unclear risk

Zhang 2007

Methods	Randomised: yes Method of allocation: not stated Blinding: none Dropouts: two did not complete the control follow-up assessment because they believed the control group was not helpful
Participants	58 men approached, 33 consented, 3 dropouts Recruitment: post-operative Included: all incontinent men 6 months after radical prostatectomy
Interventions	Group A (14) intervention: PFMT plus BF using rectal electrical sensor, initial 45 minute session with physical therapist then written instructions to carry out at home three times a day for 10 minutes. Plus support group, 6 meetings in 3 months with a health psychologist Group B (15) control: PFMT plus BF using rectal electrical sensor, initial 45 minute session with physical therapist then written instructions to carry out at home three times a day for 10 minutes
Outcomes	Length of follow-up: 3 months Frequency of PFMT: 4 to 7 times per week A 12/14, B 6/13, P = 0.077 Use of pad or brief: A 7/14 (50%), B 11/13 (85%), P = 0.057 Not able to control urge to urinate and prevent leakage: A 4/14, B 8/13, P = 0.085 Nocturia per week (mean): A 13, B 15.08, P = 0.484 VAS for severity of UI: A 3.21, B 4.65, P = 0.057 (t = -1.902) QoL measured by Illness Intrusiveness Questionnaires (IIRS): A 10.96, B 17.27, P = 0.037 Mann Whitney U = 48.5
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No description. Therefore judged to be unclear risk

Zhang 2007 (Continued)

Allocation concealment (selection bias)	Unclear risk	“Randomised”
Blinding of participants (performance bias)	High risk	Group therapy (unable to blind to intervention)
Blinding of personnel (performance bias)	Unclear risk	A research assistant, who was a doctoral candidate in medical anthropology, collected data under supervision
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not specified. Therefore judged to be unclear risk
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Two dropouts in the control group
Selective reporting (reporting bias)	Low risk	Outcomes reported
Financial support	Low risk	“This study was supported by an American Cancer Society pilot research grant and the Frances Payne Bolton School of Nursing at Case Western Reserve University”
Approved by medical ethics committee	Unclear risk	Not reported. Therefore judged to be unclear risk
Informed consent	Unclear risk	“33 patients consented to participate”
ITT analysis	Unclear risk	Not reported. Therefore judged to be unclear risk

ExMI = extra-corporeal magnetic innervation; g = gram(s); PFMT = pelvic floor muscle training; TURP = transurethral resection of the prostate; UI = urinary incontinence

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Bennett 1997	Insufficient information to assess study for inclusion. Abstract only, no data included. Attempts to contact the author for data unsuccessful
Bocker 2002	Data from study that included male postprostatectomy and female post-polio patients. Translation obtained as reported in German. Data from the two groups were not separated and therefore not in a usable form

(Continued)

Burkert 2011	Not measuring incontinence
Ceresoli 2002	Insufficient information to assess study for inclusion. Attempts to contact the author for data unsuccessful
Chang 1998	Data from study which involved post-TURP patients. Two groups, treatment and control. Not randomly assigned to groups, first 25 consecutively assigned to control, next 25 to intervention
Cornel 2005	Descriptive study. No control group
Cornu 2011	RCT. PFMT + Duloxetine (drug) versus PFMT + placebo
Crevenna 2003	Descriptive pilot study. No control group
Dieperink 2013	Intervention after radiotherapy only
Eren 2013	RCT, 58 men after RP. Pharmacological intervention: Duloxetine + PFMT versus PFMT alone
Filocamo 2007	RCT, 112 men after RP. Pharmacological intervention: Duloxetine + PFMT versus PFMT alone
Griebling 1999	Insufficient information to assess study for inclusion. Data reported in paper presentation and in later published report did not contain sufficient detail of analysis to include in tables of comparison. Attempts to contact authors not successful in providing further data
Hotston 2006	Pharmacological intervention
Ip 2004	Education intervention (refrigerator magnet) not an intervention included in review
Kahihara 2006	A comparative study. Early versus delayed PFMT no randomisation
Lin 2012	Measuring erectile dysfunction only
McGlynn 2004	Descriptive study of change in education delivery approach. No control group
Mishel 2002	Data not separated for men who received radiotherapy and those who underwent prostate surgery
Nehra 2001	Insufficient information to assess study for inclusion. Abstract only. Attempts to contact authors for further data unsuccessful. Possibly ongoing trial but no further data available
Ottenbacher 2013	RCT but of written information about diet and general exercise
Pemberton 2006	Comparative study of different types of urinary sheath
Prota 2012	Measuring erectile dysfunction, no useable data
Pulker 2002	Descriptive study. No control group

(Continued)

Ribeiro 2013	Not prostatectomy
Ricci 2004 NEWa	Measuring “sensory urgency” only, not incontinence
Robinson 2012	Measuring the validity of a specific test, no useable data
Salinas Casado 1991	Descriptive study. No control group. Article in Spanish with English abstract
Salinas Casado 1996	Descriptive study. No control group. Article in Spanish with English abstract
Seki 2005	Descriptive study. No control group
Shen 2012 NEWa	Not looking at incontinence. Translation obtained as reported in Chinese
Traeger 2013	Data for men who received radiotherapy not separated from those who underwent prostate surgery
Yang 2010 NEWa	Not randomised. Translation obtained as reported in Chinese
Yao 2012	Not RCT. Physiotherapist-guided PFMT versus control (retrospective analysis)
Zahariou 2009	Not randomised
Zermann 1999	Descriptive study. No control group
Zhang 2009	Data for men who received radiotherapy not separated from those who underwent surgery

Estim = Electrical stimulation

ExMI = Extra-corporeal magnetic innervation

TURP = Transurethral resection of the prostate

Characteristics of studies awaiting assessment [ordered by study ID]

Crivellaro 2011

Methods	Not enough information
Participants	73 men after retropubic radical prostatectomy
Interventions	Ultrasound-guided biofeedback versus biofeedback using verbal instructions and digital biofeedback
Outcomes	
Notes	Authors to be contacted regarding whether assignment was randomised

Delmastro 2010

Methods	Open label RCT
Participants	Men scheduled for radical prostatectomy
Interventions	Preoperative intensive PFMT with or without proprioceptive training
Outcomes	Anal examination to assess pelvic floor muscle function; subjective and objective voiding and incontinence parameters; four tests of pelvic floor muscle function; PGI-I; ICIQ-male score
Notes	Further information needed from authors

Lilli 2006 NEW

Methods	Unclear if randomised, further information from authors required
Participants	<p>Time of recruitment: pre-operative</p> <p>Population: Men having a radical prostatectomy (whole population, with or without UI)</p> <p>Included: Men who were candidates for retropubic radical prostatectomy</p> <p>Excluded: Acquired or congenital disability, cardiovascular diseases requiring the administration of drugs that interfere with voiding, e.g. diuretics and/or alpha-blockers, problems relating to vesico-sphincter innervations, episodes of unstable or transitory continence during their lifetime, any type of neuropathy, other cancers, and psychoaffective disturbances such as depression or insomnia</p> <p>Age (mean, SD): A 68 (?); B 68 (?)</p> <p>Dropouts: Not reported</p> <p>Baseline characteristics: Comparable at baseline</p>
Interventions	<p>Time of intervention: Pre-operative</p> <p>A (45): 20 mins of PFMT + biofeedback daily for 15 weeks before surgery, instructed to: carry out exercises during increased abdominal pressure (coughing, extending the abdomen, raising the head and keeping it raised), instructed how to carry out rapid, brief contractions without increasing abdominal activity and how to perform slow contractions</p> <p>B (45): Instructed to start PFMT at home 15 weeks before surgery</p> <p>After surgery and removal of catheter, all men were instructed to carry out four series of PF contractions at home on a daily basis for six months</p> <p>Duration of treatment: 6 months</p> <p>Follow up: 1 month, 3 months and 6 months after surgery</p>
Outcomes	<p>Primary outcome (number of men with UI):</p> <p>Number of incontinent men (defined as use of pads):</p> <p>Pre-operative: A 0/45; B 0/45</p> <p>1 month: A 42/45; B 42/45</p> <p>3 months: A 30/45; B 33/45</p>

Lilli 2006 NEW (Continued)

	6 months: A 13/45; B 15/45 Other outcomes: Number of continent men (defined as completely dry without the use of pads): Pre-operative: A 45/45; B 45/45 1 month: A 3/45; B 3/45 3 months: A 15/45; B 12/45 6 months: A 32/45; B 30/45
Notes	Unclear if randomised

Simeit 2010 NEW

Methods	RCT
Participants	Men with urinary incontinence after radical prostatectomy
Interventions	A: PFMT B: PFMT with additional 'BBS trainer'
Outcomes	Quality of life (EORTC questionnaire), impact of incontinence
Notes	Awaiting German translation

Zellner 2011 NEW

Methods	RCT
Participants	Men after radical prostatectomy
Interventions	A: PFMT + biofeedback + electrical stimulation B: Whole body vibration C: Guided PFMT
Outcomes	International Prostate Symptom Score (IPSS), the enclosed question about quality of life (IPSS-QL), pad test, pelvic floor strength, maximum uroflow, micturition volume, serum testosterone and blood glucose
Notes	Awaiting German translation

Zhang 2013

Methods	RCT
Participants	127 Men with incontinence after "cancer treatment" Radical prostatectomy?
Interventions	A: Biofeedback + PFMT + 6 biweekly sessions of problem-solving therapy delivered through a support group, B: Biofeedback + PFMT + 6 biweekly sessions of Problem-solving therapy delivered through telephone contact, C (?): Standard care

Zhang 2013 (Continued)

Outcomes	Number of incontinent men [need for wearing a pad]
Notes	Further information required about participants + no useable data

Characteristics of ongoing studies [ordered by study ID]**Burnett 2012**

Trial name or title	Health Interventions in Men Undergoing Radical Prostatectomy- A Randomized Controlled Clinical Trial
Methods	RCT
Participants	Men undergoing radical prostatectomy
Interventions	Intensive fitness intervention
Outcomes	Expanded Prostate Cancer Index (EPIC)-26, RAND-12 Questionnaire, body weight change, body mass index (BMI) change, blood pressure (BP) change, International Index of Erectile Function (IIEF), Quality of Erection Questionnaire (QEQ)
Starting date	December 2012
Contact information	Arthur L Burnett, Johns Hopkins Hospital, Baltimore, United States
Notes	

Burnett 2013

Trial name or title	Study of Non-Invasive Vibrect Penile Vibratory Stimulation Regimen to Enhance Recovery of Erectile Function/Rigidity and Urinary Control/Continence After Nerve Sparing Radical Prostatectomy (RP) for Clinically Localized Prostate Cancer
Methods	RCT
Participants	Men with Urinary Incontinence
Interventions	Post-operative use of Vibrect device 3 days after catheter removal, daily usage for 7-10 minutes versus no treatment
Outcomes	Recovery of erectile function following radical prostatectomy, IIEF, recovery of continence, EPIC urinary and sexual domain, AUA, EHS EDITS and TSS questionnaires
Starting date	April 2013
Contact information	Arthur L. Burnett, M.D., Johns Hopkins University

Burnett 2013 (Continued)

Notes	
-------	--

Fode 2012 NEW

Trial name or title	Mechanical Nerve Stimulation in the Treatment of Post Prostatectomy Incontinence
Methods	RCT
Participants	Men with urinary incontinence more than 1 year after radical prostatectomy
Interventions	Medical vibrator used daily for 6 weeks
Outcomes	24 hour pad test, Micturition diary, Validated symptom score ICI-Q, IPSS
Starting date	June 2012
Contact information	Copenhagen University Hospital at Herlev
Notes	

Goode 2014

Trial name or title	Perioperative Post-Prostatectomy Incontinence Home Telehealth Program (ProsTel)
Methods	RCT
Participants	Men undergoing radical prostatectomy
Interventions	Guided PFMT using a telehealth device (home messaging unit)
Outcomes	Time to continence using ICIQ-SF, EPIC-UI, HRQOL, IIQ-SF, IPSS, patient satisfaction questionnaire, Estimated Percent improvement, Global perception of Improvement
Starting date	January 2012
Contact information	Department of Veterans Affairs
Notes	

Mina 2013

Trial name or title	A Multicentre, Pilot Randomized Controlled Trial to Examine the Effects of Prehabilitation on Functional Outcomes After Radical Prostatectomy
Methods	RCT

Mina 2013 (Continued)

Participants	Men undergoing radical prostatectomy
Interventions	Behavioral: Prehabilitation (PREHAB)
Outcomes	Adherence to Prehabilitation Program, Recruitment, Contamination, Study Retention, Physical Fitness, Quality of Life, Psychosocial Wellbeing, Physical Activity, Treatment Complications, Post-operative length of stay
Starting date	November 2013
Contact information	Daniel Santa Mina, University Health Network, Toronto, Ontario, Canada
Notes	

Ng 2011

Trial name or title	Trial study of the efficacy of intensive preoperative pelvic floor muscle training to decrease post-prostatectomy urinary incontinence
Methods	RCT
Participants	Men with urinary incontinence after radical prostatectomy
Interventions	Preoperative guided PFMT 3 weeks before surgery versus PFMT on the day of admission for surgery
Outcomes	Pad test, IIQ-7, SF 12
Starting date	February 2011
Contact information	Sau-loi NG, Queen Mary Hospital, Hong Kong
Notes	

Terrone 2007

Trial name or title	Prevention of Urinary Incontinence After Prostatectomy
Methods	RCT
Participants	Men undergoing radical prostatectomy
Interventions	BioFeedback; Functional Electrical Stimulation; Pelvic Floor Muscle training exercises
Outcomes	24-hour PAD test: Complete continence
Starting date	February 2007

Terrone 2007 (Continued)

Contact information	Carlo Cisari, Azienda Ospedaliero Universitaria Maggiore della Carita
Notes	

Zopf 2012

Trial name or title	Implementation and scientific evaluation of rehabilitative sports groups for prostate cancer patients: study protocol of the ProRehab Study
Methods	“Patient preference RCT”?
Participants	Men after radical prostatectomy
Interventions	exercise intervention - rehabilitative sports group
Outcomes	“quality of life using EORTC-QLQ-C30/PR 25, incontinence using pad test and erectile dysfunction using IIEF”
Starting date	
Contact information	German Sport University Cologne
Notes	

Estim = Electrical stimulation

ExMI = Extra-corporeal magnetic innervation

DATA AND ANALYSES

Comparison 1. Treatment of UI after radical: PFMT ± biofeedback versus no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of incontinent men	9		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.1 less than 3 months	7	980	Risk Ratio (M-H, Random, 95% CI)	0.95 [0.84, 1.08]
1.2 within 3-6 months	7	895	Risk Ratio (M-H, Random, 95% CI)	0.96 [0.83, 1.10]
1.3 within 6-12 months	5	792	Risk Ratio (M-H, Random, 95% CI)	0.91 [0.73, 1.14]
1.4 after 12 months	3	665	Risk Ratio (M-H, Random, 95% CI)	0.85 [0.60, 1.22]
2 Number of incontinence episodes per day	2		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
2.1 less than 3 months	2	400	Mean Difference (IV, Fixed, 95% CI)	-1.09 [-1.39, -0.78]
2.2 within 3-6 months	1	227	Mean Difference (IV, Fixed, 95% CI)	-0.20 [-1.40, 1.00]
2.3 within 6-12 months	1	217	Mean Difference (IV, Fixed, 95% CI)	-0.20 [-1.33, 0.93]
2.4 after first year	1	211	Mean Difference (IV, Fixed, 95% CI)	0.10 [-0.82, 1.02]
3 Number of men using pads	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3.1 less than 3 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.2 within 3-6 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.3 within 6-12 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.4 after 12 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
4 Pad changes over 24 hours	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4.1 less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.2 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.3 within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.4 after first year	0		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5 Urinary Incontinence Score (ICIQ-SF)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5.1 less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.2 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.3 within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.4 after first year	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
6 Quality of life related to urinary incontinence	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
6.1 less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
6.2 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
6.3 within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
6.4 after first year	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
7 Adverse events	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
8 24 hour pad test (grams of urine lost)	2		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
8.1 less than 3 months	2	214	Mean Difference (IV, Fixed, 95% CI)	22.29 [-33.12, 77.70]
8.2 within 3-6 months	2	213	Mean Difference (IV, Fixed, 95% CI)	11.87 [-40.77, 64.52]
8.3 within 6-12 months	2	194	Mean Difference (IV, Fixed, 95% CI)	11.23 [-22.35, 44.82]
8.4 after first year	1	167	Mean Difference (IV, Fixed, 95% CI)	39.0 [-5.72, 83.72]

9 1 hour pad test (grams of urine lost)	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
9.1 less than 3 months	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
9.2 within 3-6 months	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
9.3 within 6-12 months	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
9.4 after first year	0	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
10 Number of men not carrying out pelvic floor muscle contractions at 12 months	1	Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 2. Treatment of UI after radical: electric or magnetic energy versus no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of incontinent men	4		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 less than 3 months	2	96	Risk Ratio (M-H, Fixed, 95% CI)	0.77 [0.60, 0.98]
1.2 within 3-6 months	1	53	Risk Ratio (M-H, Fixed, 95% CI)	0.48 [0.29, 0.79]
1.3 within 6-12 months	2	83	Risk Ratio (M-H, Fixed, 95% CI)	0.37 [0.18, 0.73]
1.4 after 12 months	3	413	Risk Ratio (M-H, Fixed, 95% CI)	0.26 [0.09, 0.74]
2 Adverse effects	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3 24 hour pad test (grams of urine lost)	2	325	Mean Difference (IV, Fixed, 95% CI)	-16.94 [-58.21, 24.33]
3.1 less than 3 months	2	96	Mean Difference (IV, Fixed, 95% CI)	-27.82 [-116.97, 61.33]
3.2 within 3-6 months	2	93	Mean Difference (IV, Fixed, 95% CI)	5.12 [-86.19, 96.43]
3.3 within 6-12 months	2	89	Mean Difference (IV, Fixed, 95% CI)	-1.95 [-64.03, 60.13]
3.4 after first year	1	47	Mean Difference (IV, Fixed, 95% CI)	-80.0 [-190.50, 30.50]
4 Urinary Incontinence Score (ICIQ-short form UI score)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4.1 less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.2 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.3 within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.4 after first year	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5 Urinary Incontinence Quality of Life Score (ICIQ-short form)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5.1 less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.2 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.3 within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.4 after first year	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
6 Time until continent (months)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

Comparison 4. Treatment of UI after radical: combinations of treatments versus no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of incontinent men at < 3 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
1.1 PFMT + anal Estim + Biofeedback vs no treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
2 Number of incontinent men within 3-6 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2.1 PFMT + anal Estim + Biofeedback vs no treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3 Number of incontinence episodes per day at > 3 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3.1 PFMT + anal Estim + BFB	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4 Adverse effects	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
4.1 PFMT + anal Estim + BFB	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 5. Treatment of UI after radical: one active treatment versus another active treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of incontinent men at < 3 months	2		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 PFMT + Anal EStim vs PFMT alone	2	177	Risk Ratio (M-H, Fixed, 95% CI)	0.96 [0.83, 1.12]
2 Number of incontinent men within 3 to 6 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2.1 PFMT + BF + support group vs PFMT + BF	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3 Number of incontinent men within 6 to 12 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3.1 FES vs ExMI	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
4 Number of incontinence episodes at < 3 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4.1 PFMT + anal EStim vs PFMT alone	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5 Quality of Life Score (severity of UI) within 3 to 6 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5.1 PFMT + BF + support group vs PFMT + BF	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
6 Quality of Life Score (I-QoL) within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected

6.1 PFMT + BF + EStim vs PFMT	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
7 Quality of Life Score (ICI-Q-SF) within 6-12 months	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
7.1 PFMT + ExMI vs PFMT	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
8 Adverse events	1	Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
8.1 PFMT + Anal EStim vs PFMT alone	1	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
9 1 hour pad test (grams of urine lost): at < 3 months	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
9.1 PFMT + anal EStim vs PFMT alone	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
9.2 PFMT + perineal EStim vs PFMT alone	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
9.3 PFMT + perineal EStim vs PFMT + anal EStim	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
10 24 hour pad test (grams of urine lost): at < 3 months	2	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
10.1 PFMT + anal EStim vs PFMT alone	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
10.2 PFMT + visual BF vs PFMT + oral BF	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
11 24 hour pad test (grams of urine lost): within 3 to 6 months	2	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
11.1 PFMT + anal EStim vs PFMT alone	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
11.2 PFMT + visual BF vs PFMT + oral BF	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
12 24 hour pad test (grams of urine lost): within 3 to 6 months	3	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
12.1 PFMT + anal EStim vs PFMT alone	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
12.2 PFMT + visual BF vs PFMT + oral BF	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
12.3 ExMI vs PFMT alone	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
13 Pad changes over 24 hours within 3 to 6 months	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
13.1 ExMI vs PFMT alone	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
14 Number of men not carrying out sufficient PFMT within 3 to 6 months	1	Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
14.1 PFMT + BF + support group vs PFMT + BF	1	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 6. Prevention of UI after radical: PFMT ± biofeedback versus no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of incontinent men	8		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.1 less than 3 months	7	663	Risk Ratio (M-H, Random, 95% CI)	0.93 [0.83, 1.06]
1.2 within 3-6 months	7	697	Risk Ratio (M-H, Random, 95% CI)	0.85 [0.75, 0.97]
1.3 within 6-12 months	6	640	Risk Ratio (M-H, Random, 95% CI)	0.51 [0.35, 0.75]
1.4 after 12 months	2	373	Risk Ratio (M-H, Random, 95% CI)	0.32 [0.20, 0.51]
2 Pad changes over 24 hours	1		Mean Difference (IV, Random, 95% CI)	Totals not selected
2.1 less than 3 months	1		Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
2.2 within 3-6 months	1		Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
2.3 within 6 - 12 months	1		Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
3 1 hour pad test (grams of urine lost)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3.1 Less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.2 Within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.3 Within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4 24 hour pad test (gm/24hrs)	4		Mean Difference (IV, Random, 95% CI)	Subtotals only
4.1 less than 3 months	3	424	Mean Difference (IV, Random, 95% CI)	-78.19 [-211.46, 55.07]
4.2 within 3-6 months	2	373	Mean Difference (IV, Random, 95% CI)	-73.28 [-196.42, 49.86]
4.3 within 6-12 months	2	373	Mean Difference (IV, Random, 95% CI)	-14.50 [-18.36, -10.64]
4.4 after first year	2	378	Mean Difference (IV, Random, 95% CI)	-1.0 [-1.81, -0.19]
5 Number of incontinence episodes per day	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5.1 less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.2 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.3 within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.4 after first year	0		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
6 Urinary Incontinence Score (ICI-short form)	2		Mean Difference (IV, Random, 95% CI)	Subtotals only
6.1 less than 3 months	1	32	Mean Difference (IV, Random, 95% CI)	6.5 [3.45, 9.55]
6.2 within 3-6 months	2	105	Mean Difference (IV, Random, 95% CI)	-1.21 [-5.99, 3.56]
6.3 within 6-12 months	2	105	Mean Difference (IV, Random, 95% CI)	-0.69 [-3.19, 1.81]
7 Quality of Life Score (IIQ)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
7.1 less than 3 months	0		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
7.2 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
7.3 within 6-12 months	0		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
7.4 after first year	0		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
8 Pelvic floor muscle strength (anal squeeze pressure, cm H ₂ O)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
8.1 less than 3 months	0		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
8.2 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
8.3 within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
8.4 after first year	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
9 Number of men not carrying out sufficient PFMT	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

9.1 less than 3 months	0	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
9.2 within 3-6 months	1	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
9.3 within 6-12 months	1	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
9.4 after 12 months	1	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
10 Number of men having surgery for incontinence	1	Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 7. Prevention of UI after radical: electric or magnetic energy versus no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 1 hour pad test (grams of urine lost)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
1.1 Less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
1.2 Within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
1.3 Within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2 ICIQ-SF score	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2.1 Less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.2 Within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.3 Within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 9. Prevention of UI after radical: combinations of treatments versus no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of incontinent men within 3 to 6 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
1.1 PFMT + anal Estim + Biofeedback versus no treatment/sham treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
2 Number of incontinent men within 6 to 12 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
2.1 PFMT + anal Estim + biofeedback versus no treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3 24 hour pad test (grams of urine lost) within 3 to 6 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3.1 PFMT + anal Estim + Biofeedback versus no treatment/sham treatment	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4 24 hour pad test (grams of urine lost) 6 to 12 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4.1 PFMT + anal Estim + Biofeedback versus no treatment/sham treatment	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]

5 Time until continent (months)	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5.1 PFMT + anal Estim + Biofeedback versus no treatment/sham treatment	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 10. Prevention of UI after radical: one active treatment versus another active treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of incontinent men at < 3months	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 PFMT pre and post op vs PFMT post op	2	289	Risk Ratio (M-H, Fixed, 95% CI)	0.86 [0.69, 1.06]
1.2 PFMT + Biofeedback + transcutaneous Estim versus Estim only	1	54	Risk Ratio (M-H, Fixed, 95% CI)	0.88 [0.61, 1.26]
1.3 PFMT + Biofeedback + transcutaneous Estim versus post-op PFMT	1	54	Risk Ratio (M-H, Fixed, 95% CI)	0.80 [0.57, 1.11]
1.4 Post-op transcutaneous Estim versus post-op PFMT	1	52	Risk Ratio (M-H, Fixed, 95% CI)	0.90 [0.67, 1.22]
2 Number of incontinent men within 3 to 6 months	4		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 PFMT pre and post op vs PFMT post op	2	290	Risk Ratio (M-H, Fixed, 95% CI)	0.75 [0.54, 1.04]
2.2 post-op PFMT + biofeedback + transcutaneous Estim vs post-op Estim	1	54	Risk Ratio (M-H, Fixed, 95% CI)	1.55 [0.96, 2.49]
2.3 PFMT + general exercise versus PFMT alone	1	49	Risk Ratio (M-H, Fixed, 95% CI)	0.48 [0.23, 0.99]
2.4 Post-op PFMT + transcutaneous Estim + Biofeedback versus post-op PFMT	1	54	Risk Ratio (M-H, Fixed, 95% CI)	1.09 [0.76, 1.57]
2.5 Post-op transcutaneous electrical stimulation versus post-op PFMT	1	52	Risk Ratio (M-H, Fixed, 95% CI)	0.71 [0.43, 1.16]
3 Number of incontinent men within 6 to 12 months	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3.1 PFMT pre and post op vs PFMT post op	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.2 post-op PFMT + Biofeedback + transcutaneous Estim vs post-op Estim	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.3 Post-op PFMT + transcutaneous Estim + Biofeedback versus post-op PFMT	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

3.4 Post-op transcutaneous Estim versus post-op PFMT	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
4 Number of incontinent men after 12 months	4		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.1 PFMT pre and post op vs PFMT post op	3	367	Risk Ratio (M-H, Fixed, 95% CI)	1.32 [0.78, 2.25]
4.2 PFMT + Penile vibration pre and post op versus PFMT pre and post op	1	58	Risk Ratio (M-H, Fixed, 95% CI)	1.4 [0.25, 7.77]
5 No. with severe incontinence (e.g. pad test weight >150g) at < 3 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
5.1 PFMT pre and post op vs PFMT post op	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
6 No. with severe incontinence (e.g. pad test weight >150g) at 3 to 6 months	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
6.1 PFMT pre and post op vs PFMT post op	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
7 20 minute pad test (grams of urine lost): within 3 to 6 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
7.1 PFMT + anal EStim vs PFMT alone	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
7.2 PFMT + anal EStim + BF vs PFMT alone	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
7.3 PFMT + anal EStim vs PFMT + anal EStim + BF	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
8 20 minute pad test (grams of urine lost): within 6 to 12 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
8.1 PFMT + anal EStim vs PFMT alone	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
8.2 PFMT + anal EStim + BF vs PFMT alone	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
8.3 PFMT + anal EStim vs PFMT + anal EStim + BF	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
9 1 hour pad test (grams of urine lost) at less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
9.1 Pre-op PFMT + Estim versus pre-op PFMT	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
10 1 hour pad test (grams of urine lost) within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
10.1 Pre-op PFMT + electrical stimulation versus pre-op PFMT	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
11 1 hour pad test within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
11.1 Pre-op PFMT + electrical stimulation versus pre-op PFMT	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]

12	24 hour pad test (grams of urine lost) at less than 3 months	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
	12.1 PFMT + Biofeedback + transcutaneous Estim versus Estim only	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
	12.2 Post-operative PFMT + transcutaneous Estim + Biofeedback versus post-operative PFMT	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
	12.3 Post-operative transcutaneous electrical stimulation versus post-operative PFMT	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
13	24 hour pad test (grams of urine lost) within 3-6 months	2	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
	13.1 PFMT + Biofeedback + transcutaneous Estim versus Estim only	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
	13.2 Postoperative PFMT + biofeedback + transcutaneous Estim versus postoperative PFMT	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
	13.3 Post-operative transcutaneous Estim only versus post-operative PFMT only	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
	13.4 PFMT + general exercise versus PFMT alone	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
14	24 hour pad test (grams of urine lost) within 6-12 months	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
	14.1 PFMT + transcutaneous Estim + biofeedback versus Estim only	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
	14.2 Post-op PFMT + transcutaneous Estim + Biofeedback versus post-op PFMT	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
	14.3 Post-op transcutaneous Estim versus post-op PFMT	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
15	Quality of Life Score (ICS male short form) at < 3 months	2	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
	15.1 PFMT pre and post op vs PFMT post op	2	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
16	Urinary Incontinence Quality of Life Score (ICIQ - short form) within 3-6 months	3	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
	16.1 Pre-op PFMT + electrical stimulation versus pre-op PFMT	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
	16.2 PFMT + general exercise versus PFMT alone	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]

16.3 PFMT pre and post op vs PFMT post op	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
17 Urinary Incontinence Quality of Life Score (ICIQ-short form) within 6-12 months	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
17.1 Pre-op PFMT + electrical stimulation versus pre-op PFMT	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
18 King's health Questionnaire after 12 months	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
18.1 General Health	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
18.2 Role limitations	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
18.3 Physical limitations	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
18.4 Social limitations	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
18.5 Personal	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
18.6 Emotional	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
18.7 Sleep/energy disturbance	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
18.8 Symptom severity	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
19 Health status measure SF-36 within 3-6 months	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
19.1 Physical composite score	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
19.2 Mental Composite score	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
20 Adverse events	2	Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
20.1 PFMT pre and post op vs PFMT post op	1	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
20.2 PFMT + Penile vibration pre and post op versus PFMT pre and post op	1	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 11. Treatment of UI after TURP: PFMT ± biofeedback versus no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of incontinent men	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
1.1 less than 3 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
1.2 within 3-6 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
1.3 within 6-12 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
1.4 after 12 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
2 Number of incontinence episodes per day	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2.1 less than 3 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.2 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.3 within 6-12 months	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.4 after first year	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
3 Number of men using pads	1		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected
3.1 less than 3 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.2 within 3-6 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
3.3 within 6-12 months	1		Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]

3.4 after 12 months	1	Risk Ratio (M-H, Fixed, 95% CI)	0.0 [0.0, 0.0]
4 Urinary Incontinence Score (ICI-short form)	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
4.1 less than 3 months	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.2 within 3-6 months	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.3 within 6-12 months	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
4.4 after first year	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5 Quality of life related to urinary incontinence	1	Mean Difference (IV, Fixed, 95% CI)	Totals not selected
5.1 less than 3 months	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.2 within 3-6 months	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.3 within 6-12 months	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
5.4 after first year	1	Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
6 Number of men not carrying out pelvic floor muscle contractions at 12 months	1	Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 16. Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of incontinent men	2		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 less than 3 months	2	105	Risk Ratio (M-H, Fixed, 95% CI)	0.60 [0.21, 1.77]
1.2 within 3-6 months	1	48	Risk Ratio (M-H, Fixed, 95% CI)	0.51 [0.14, 1.89]
2 Health status measure SF-36 within 3-6 months	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2.1 Physical component	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.2 Physical functioning	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.3 Body pain	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.4 General Health	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.5 Physical role limitation	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.6 Mental health component	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.7 Mental role limitation	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.8 Vitality	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.9 Mental health	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
2.10 Social functioning	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]

Comparison 21. Containment of urinary incontinence from any cause: external penile compression devices (penile clamps) versus no treatment

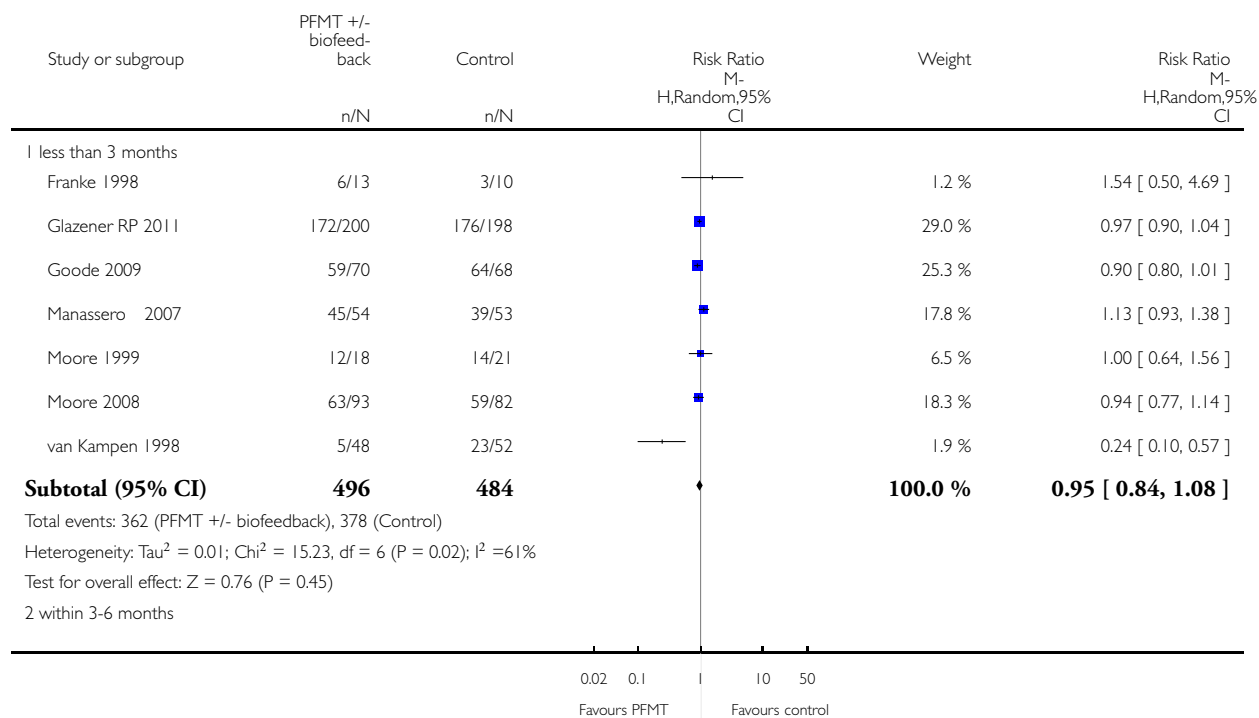
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Number of men satisfied with device			Other data	No numeric data
2 Mean urine loss (grams of urine on pad test)			Other data	No numeric data
3 Penile Doppler blood flow (mean systolic velocity)			Other data	No numeric data
4 Penile Doppler blood flow (mean resistance to flow index)			Other data	No numeric data

Analysis 1.1. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 1 Number of incontinent men.

Review: Conservative management for postprostatectomy urinary incontinence

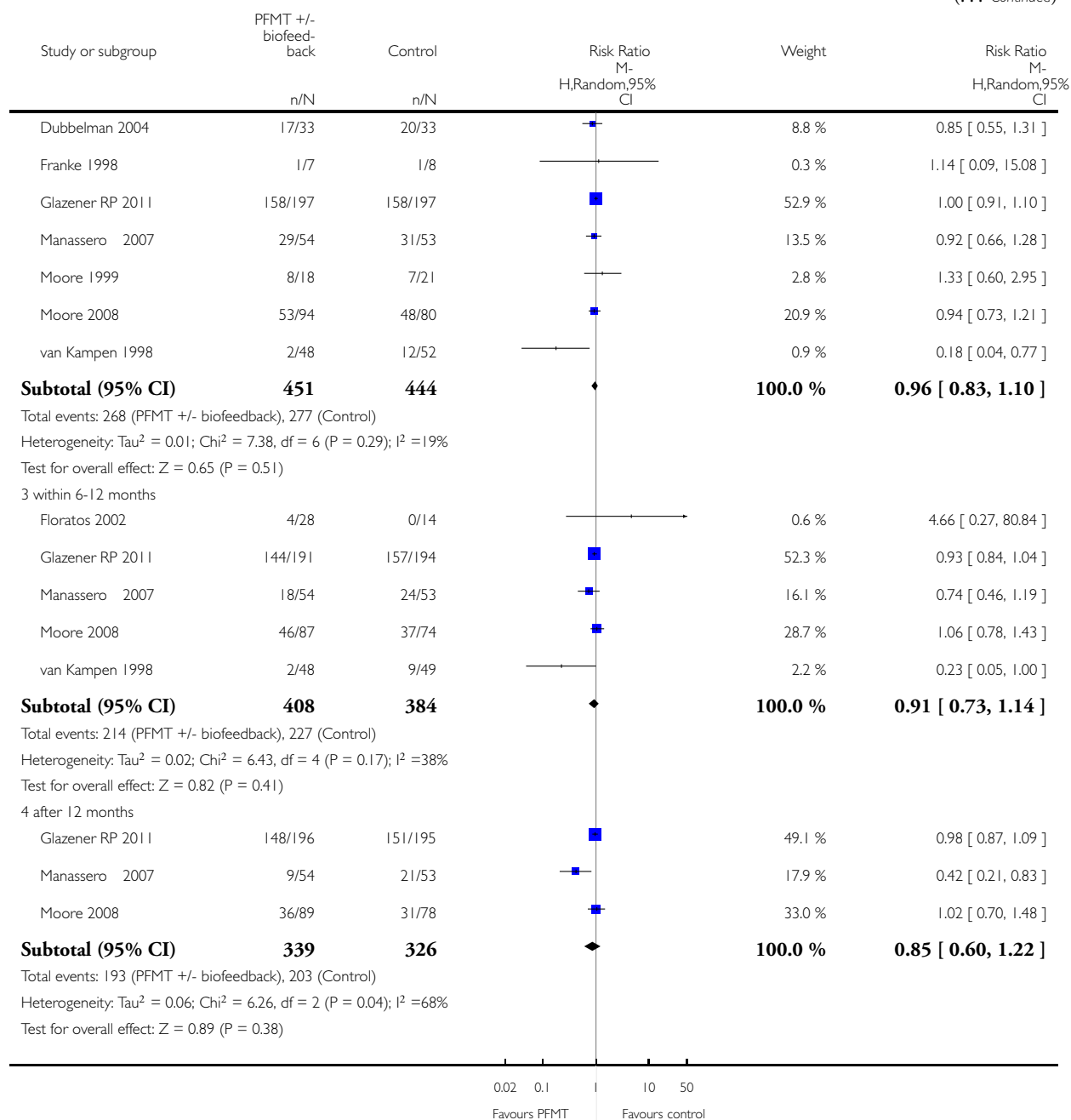
Comparison: 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment

Outcome: 1 Number of incontinent men



(Continued . . .)

(... Continued)

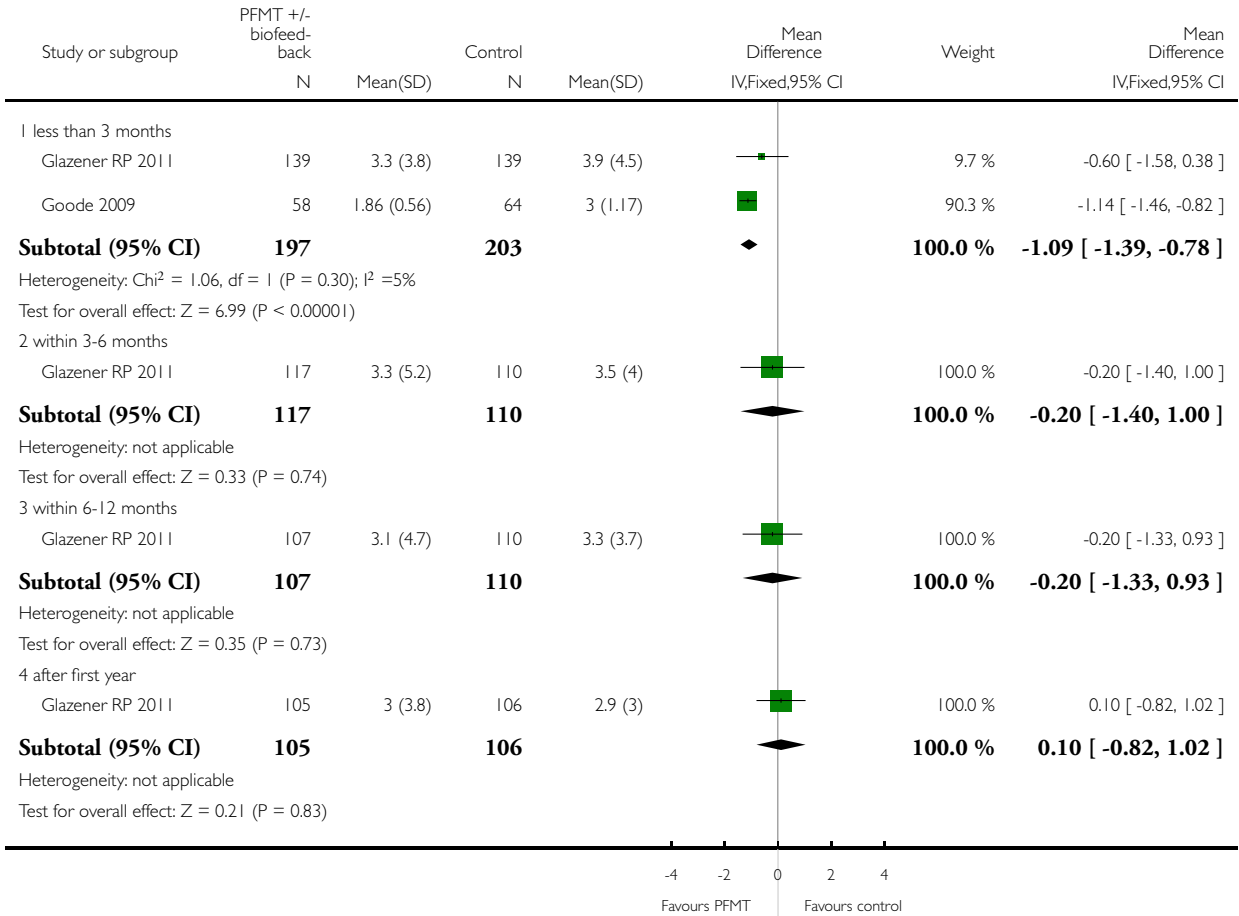


Analysis 1.2. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 2 Number of incontinence episodes per day.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment

Outcome: 2 Number of incontinence episodes per day

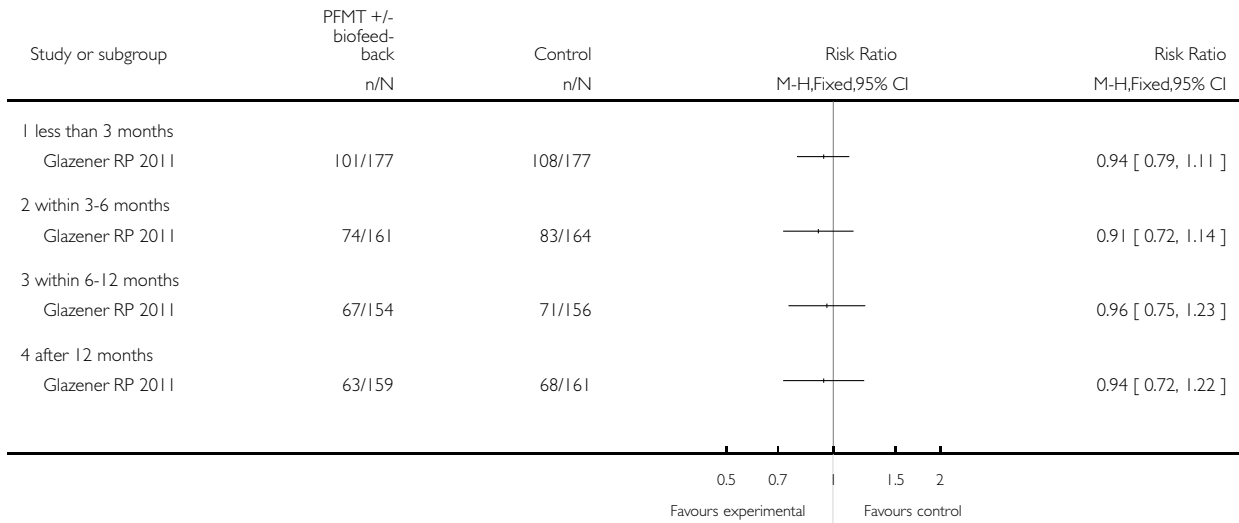


Analysis 1.3. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 3 Number of men using pads.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment

Outcome: 3 Number of men using pads

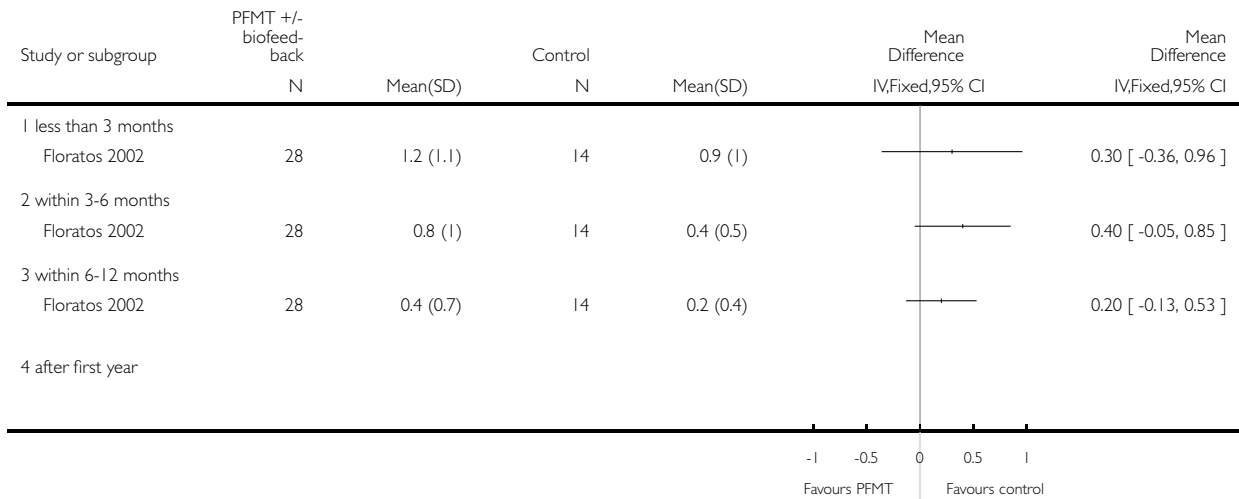


Analysis 1.4. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 4 Pad changes over 24 hours.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment

Outcome: 4 Pad changes over 24 hours

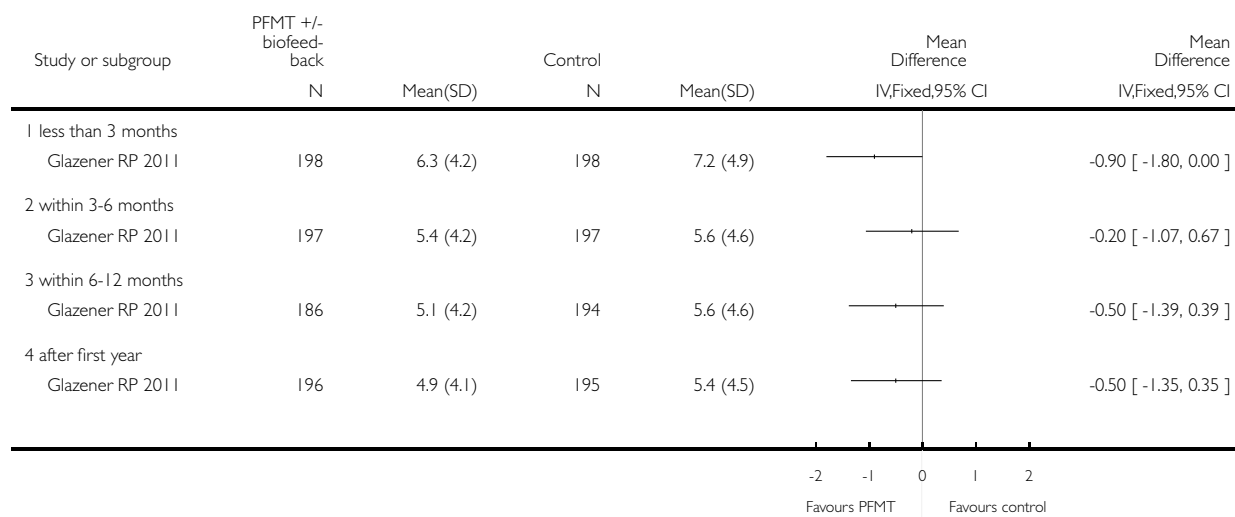


Analysis 1.5. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 5 Urinary Incontinence Score (ICIQ-SF).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment

Outcome: 5 Urinary Incontinence Score (ICIQ-SF)

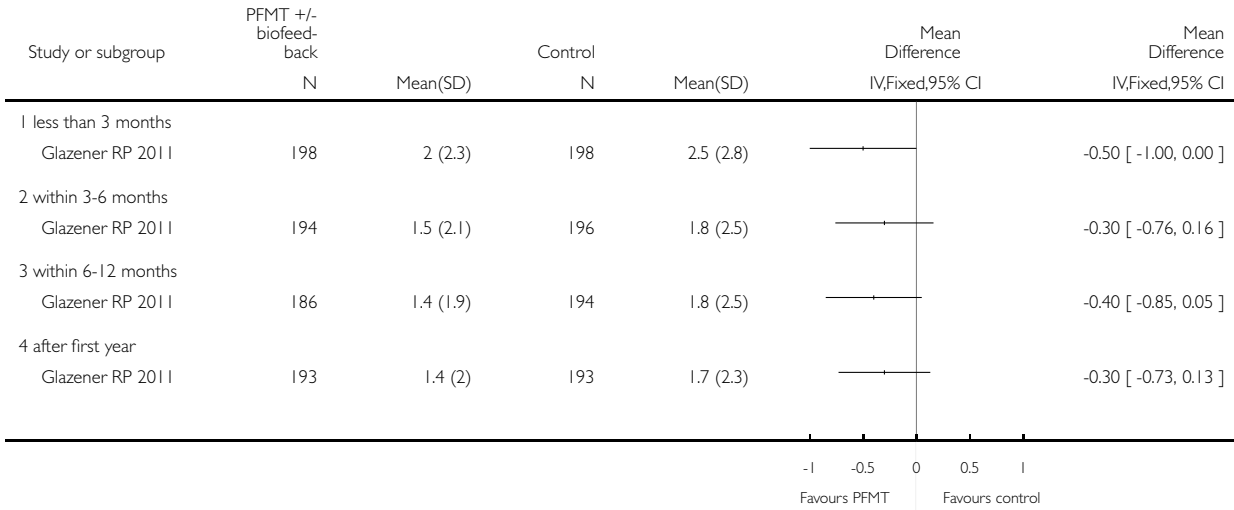


Analysis 1.6. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 6 Quality of life related to urinary incontinence.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 1 Treatment of UI after radical: PFMT biofeedback versus no treatment

Outcome: 6 Quality of life related to urinary incontinence

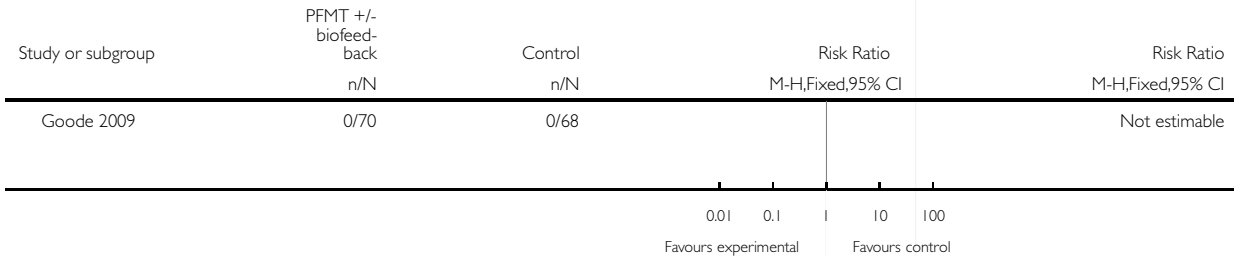


Analysis 1.7. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 7 Adverse events.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 1 Treatment of UI after radical: PFMT biofeedback versus no treatment

Outcome: 7 Adverse events

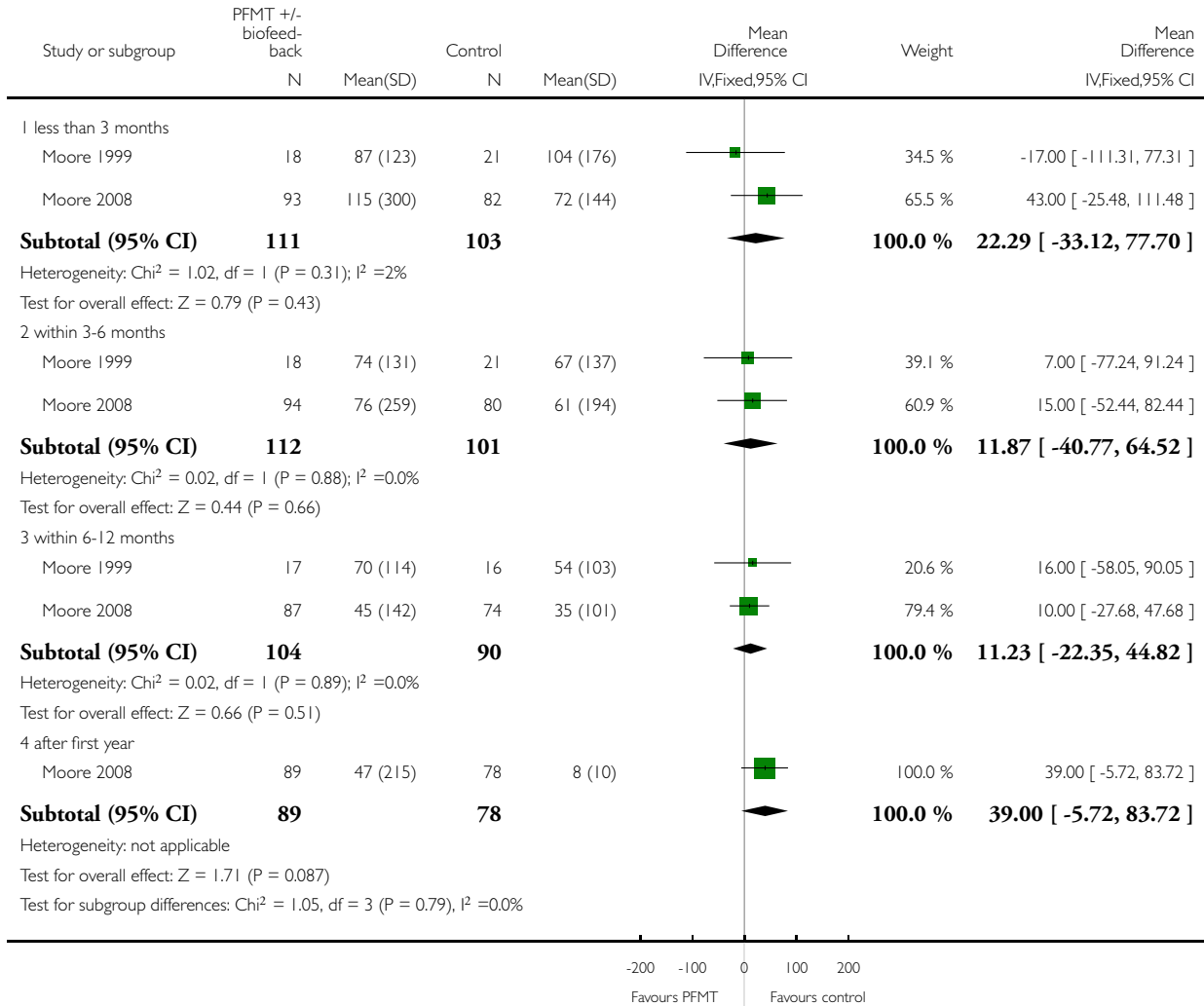


Analysis 1.8. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 8 24 hour pad test (grams of urine lost).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 1 Treatment of UI after radical: PFMT biofeedback versus no treatment

Outcome: 8 24 hour pad test (grams of urine lost)

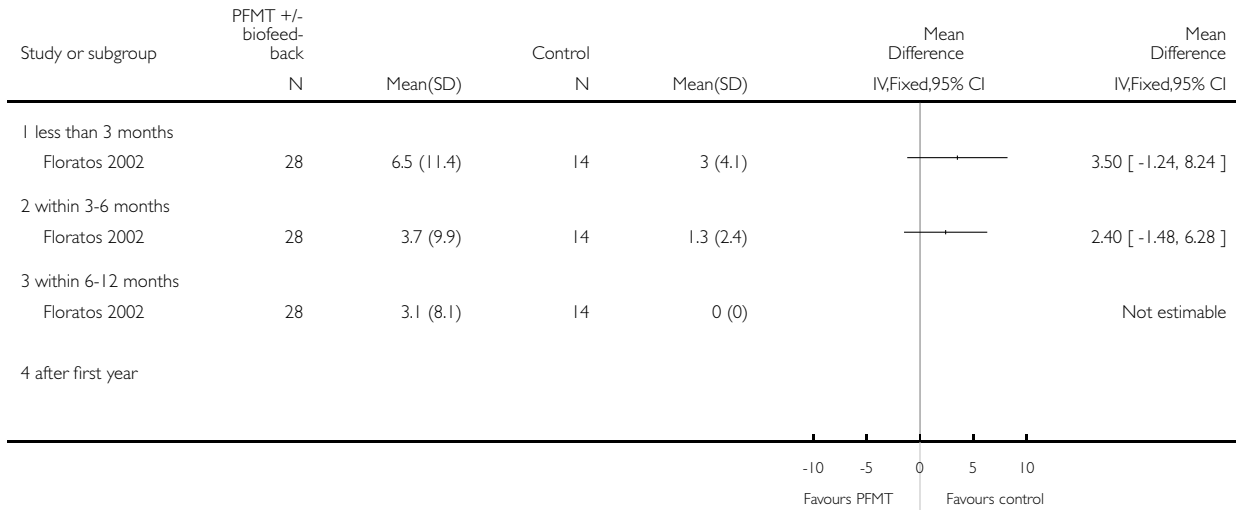


Analysis 1.9. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 9 1 hour pad test (grams of urine lost).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 1 Treatment of UI after radical: PFMT biofeedback versus no treatment

Outcome: 9 1 hour pad test (grams of urine lost)

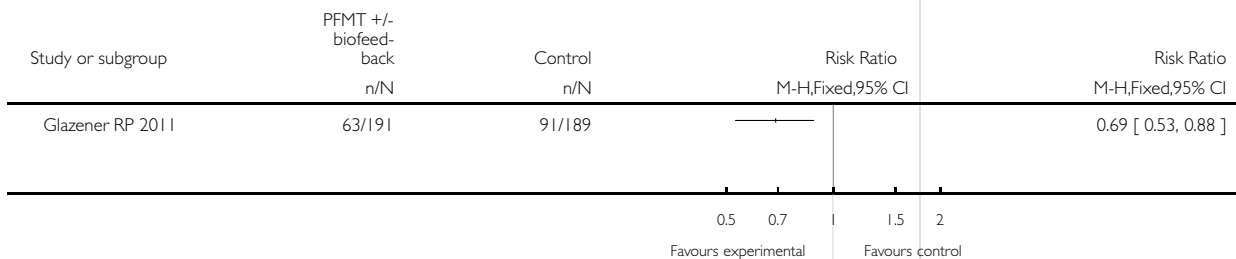


Analysis 1.10. Comparison 1 Treatment of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 10 Number of men not carrying out pelvic floor muscle contractions at 12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 1 Treatment of UI after radical: PFMT biofeedback versus no treatment

Outcome: 10 Number of men not carrying out pelvic floor muscle contractions at 12 months

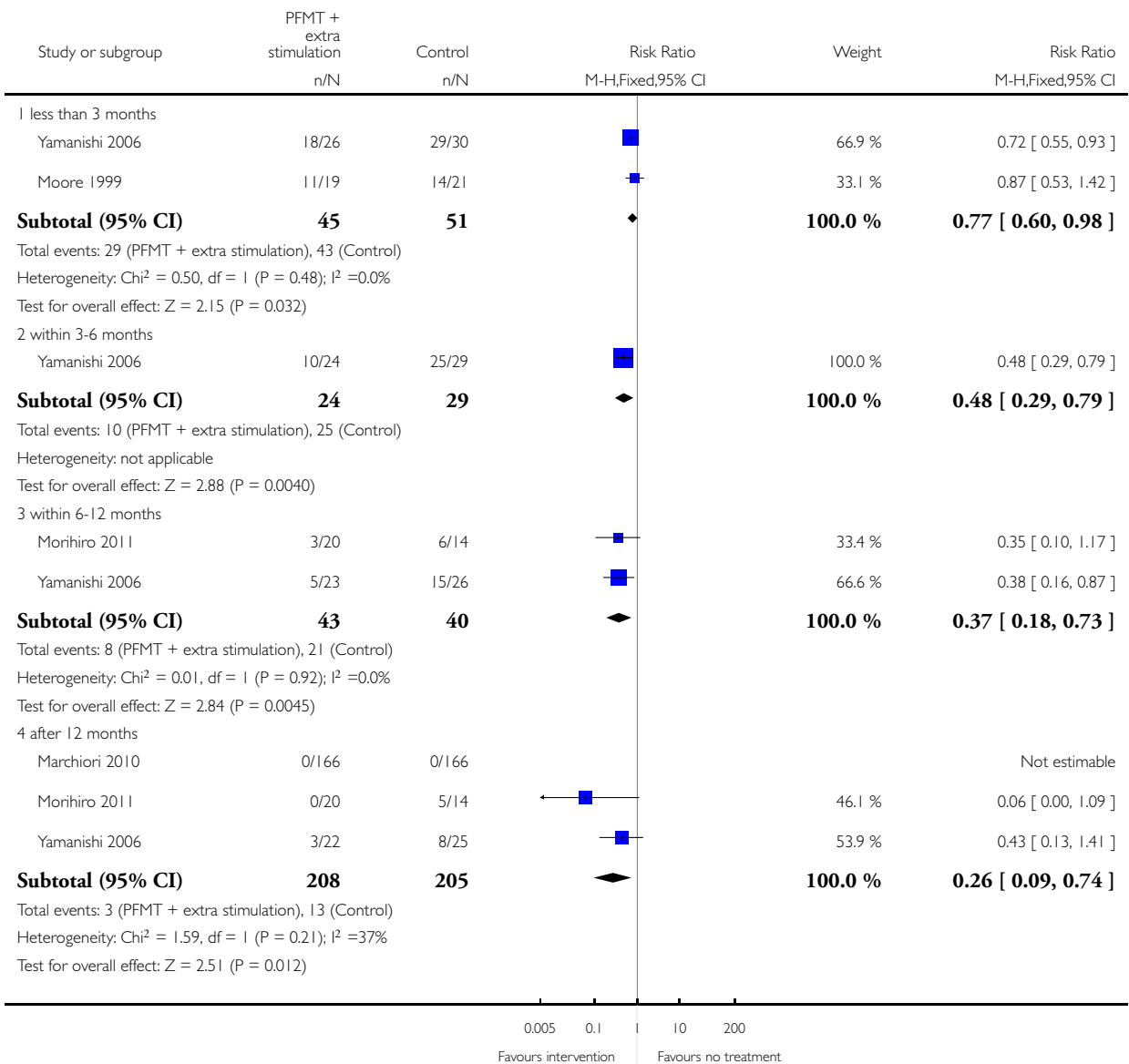


Analysis 2.1. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 1 Number of incontinent men.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 2 Treatment of UI after radical: electric or magnetic energy versus no treatment

Outcome: 1 Number of incontinent men

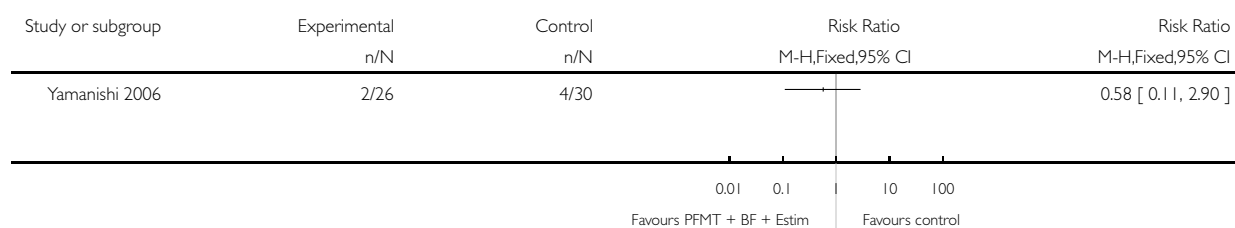


Analysis 2.2. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 2 Adverse effects.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 2 Treatment of UI after radical: electric or magnetic energy versus no treatment

Outcome: 2 Adverse effects

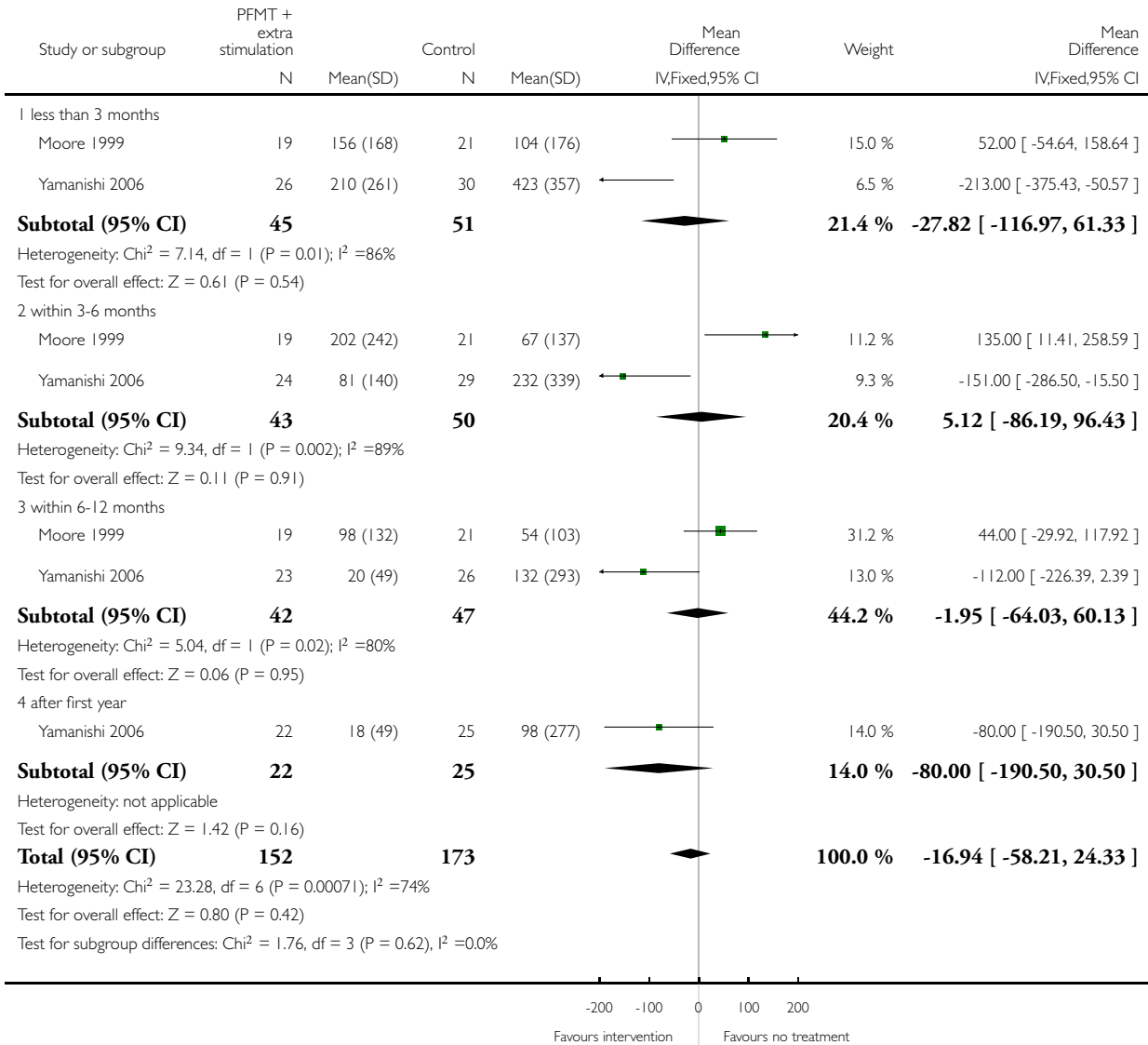


Analysis 2.3. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 3 24 hour pad test (grams of urine lost).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 2 Treatment of UI after radical: electric or magnetic energy versus no treatment

Outcome: 3 24 hour pad test (grams of urine lost)

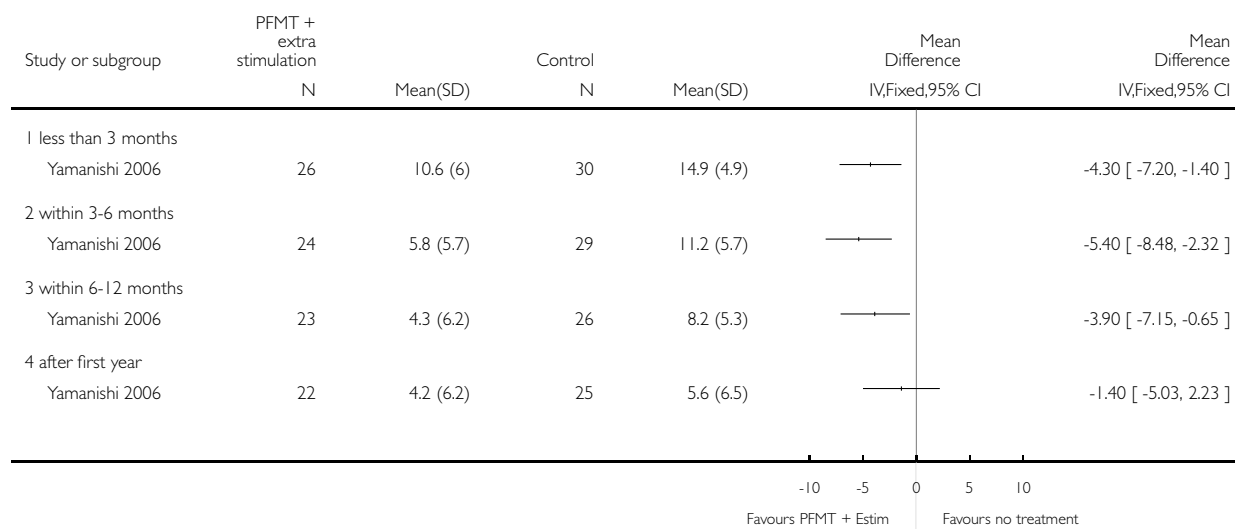


Analysis 2.4. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 4 Urinary Incontinence Score (ICIQ-short form UI score).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 2 Treatment of UI after radical: electric or magnetic energy versus no treatment

Outcome: 4 Urinary Incontinence Score (ICIQ-short form UI score)

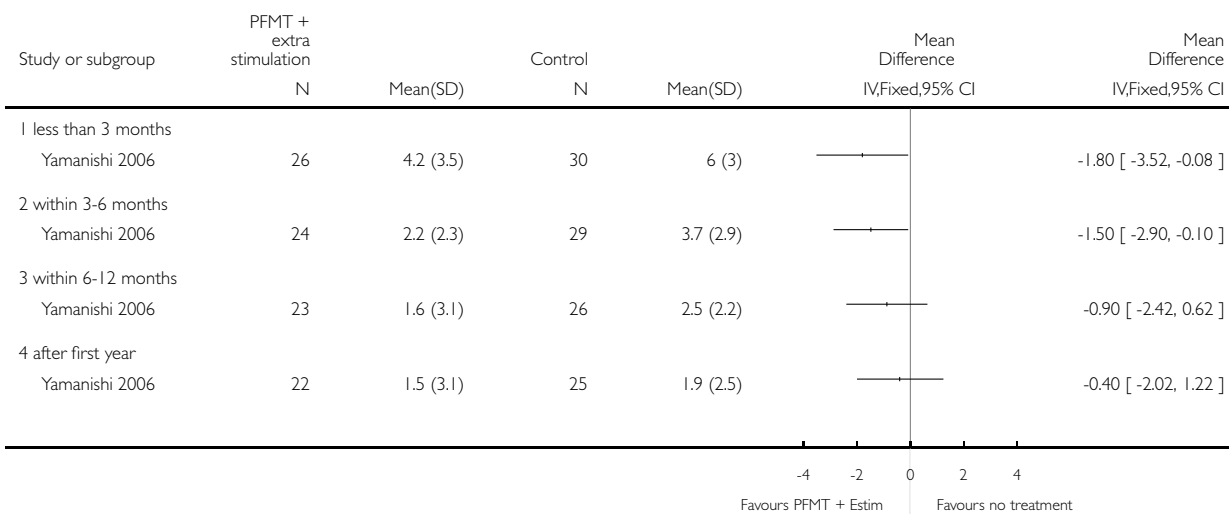


Analysis 2.5. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 5 Urinary Incontinence Quality of Life Score (ICIQ-short form).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 2 Treatment of UI after radical: electric or magnetic energy versus no treatment

Outcome: 5 Urinary Incontinence Quality of Life Score (ICIQ-short form)

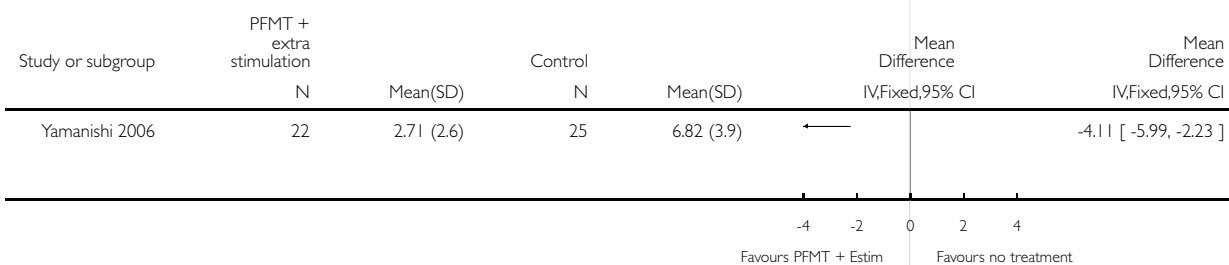


Analysis 2.6. Comparison 2 Treatment of UI after radical: electric or magnetic energy versus no treatment, Outcome 6 Time until continent (months).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 2 Treatment of UI after radical: electric or magnetic energy versus no treatment

Outcome: 6 Time until continent (months)

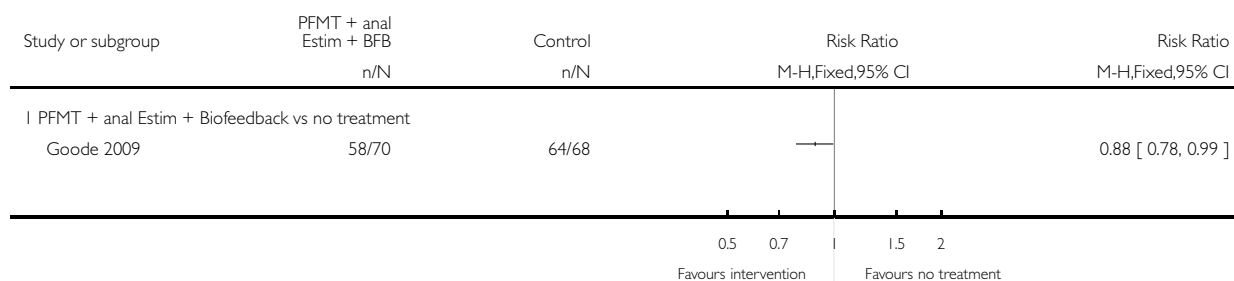


Analysis 4.1. Comparison 4 Treatment of UI after radical: combinations of treatments versus no treatment, Outcome 1 Number of incontinent men at < 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 4 Treatment of UI after radical: combinations of treatments versus no treatment

Outcome: 1 Number of incontinent men at < 3 months

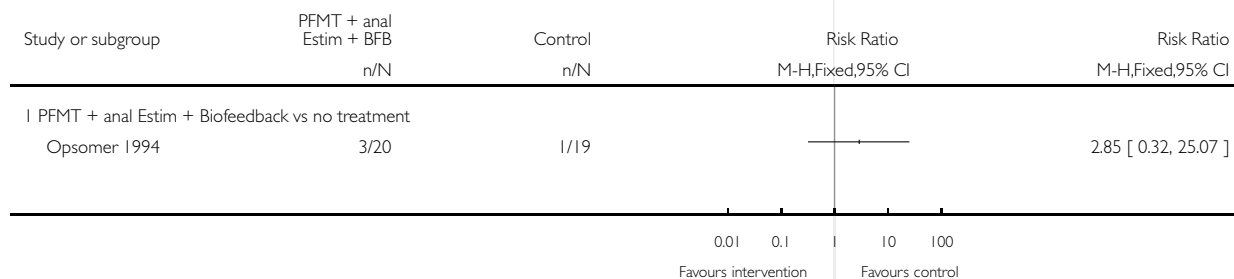


Analysis 4.2. Comparison 4 Treatment of UI after radical: combinations of treatments versus no treatment, Outcome 2 Number of incontinent men within 3-6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 4 Treatment of UI after radical: combinations of treatments versus no treatment

Outcome: 2 Number of incontinent men within 3-6 months

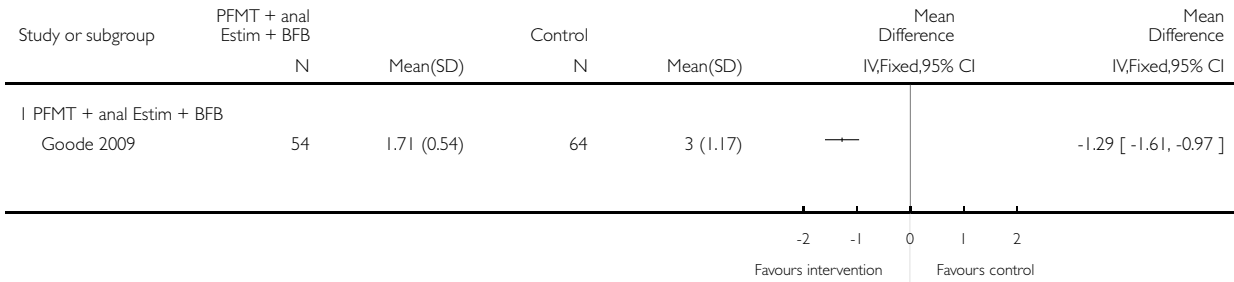


Analysis 4.3. Comparison 4 Treatment of UI after radical: combinations of treatments versus no treatment, Outcome 3 Number of incontinence episodes per day at > 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 4 Treatment of UI after radical: combinations of treatments versus no treatment

Outcome: 3 Number of incontinence episodes per day at > 3 months

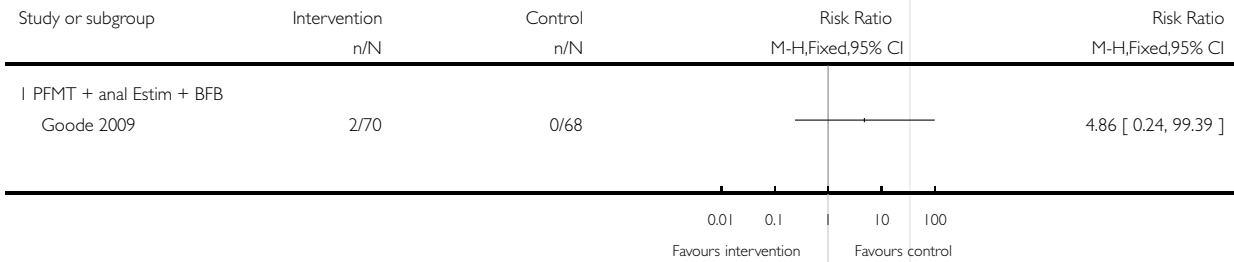


Analysis 4.4. Comparison 4 Treatment of UI after radical: combinations of treatments versus no treatment, Outcome 4 Adverse effects.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 4 Treatment of UI after radical: combinations of treatments versus no treatment

Outcome: 4 Adverse effects

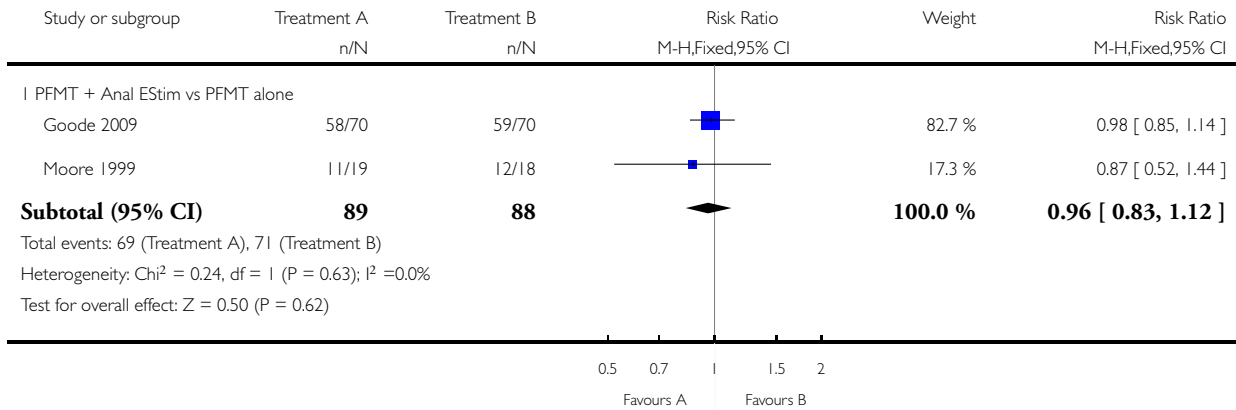


Analysis 5.1. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 1 Number of incontinent men at < 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 1 Number of incontinent men at < 3 months

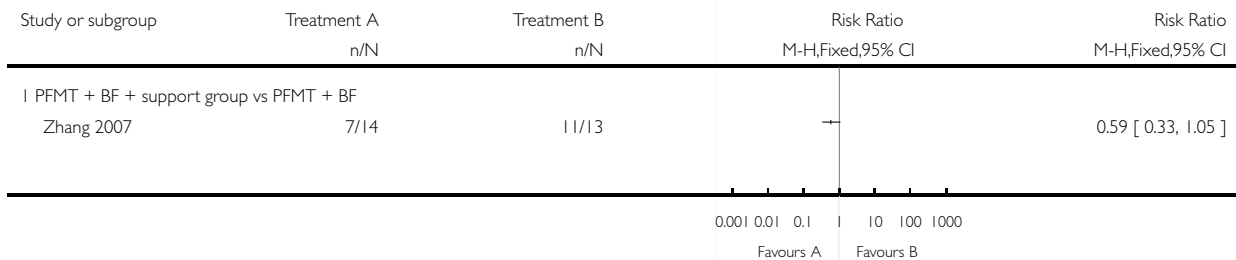


Analysis 5.2. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 2 Number of incontinent men within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 2 Number of incontinent men within 3 to 6 months

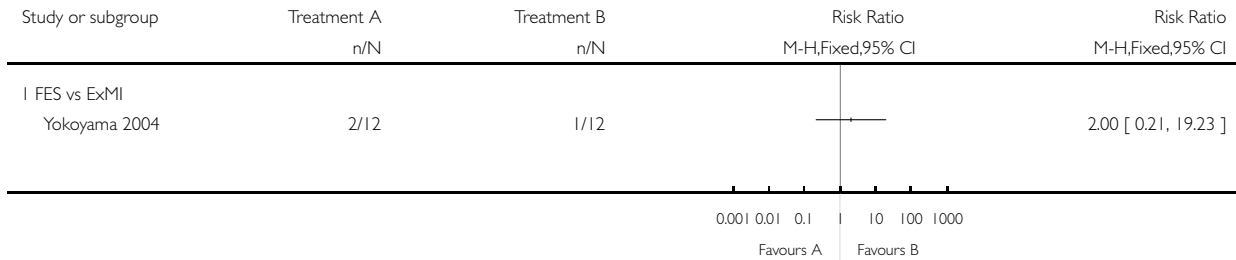


Analysis 5.3. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 3 Number of incontinent men within 6 to 12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 3 Number of incontinent men within 6 to 12 months

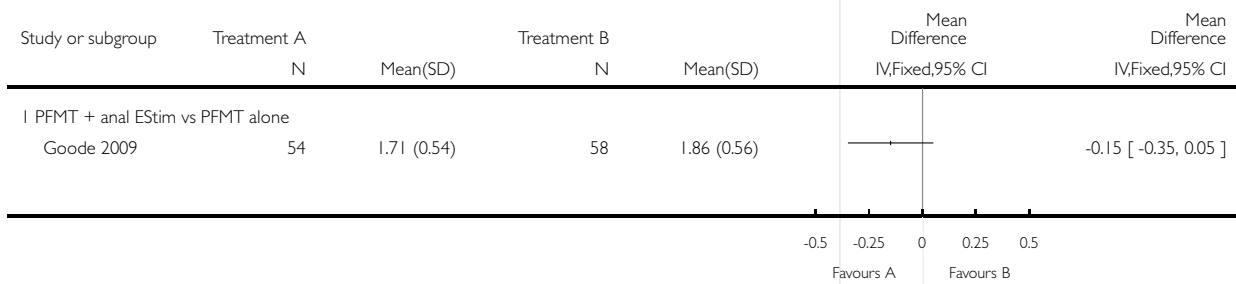


Analysis 5.4. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 4 Number of incontinence episodes at < 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 4 Number of incontinence episodes at < 3 months

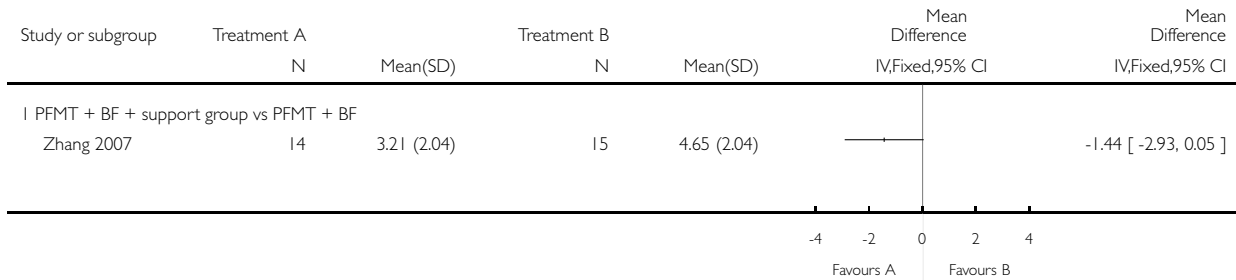


Analysis 5.5. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 5 Quality of Life Score (severity of UI) within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 5 Quality of Life Score (severity of UI) within 3 to 6 months

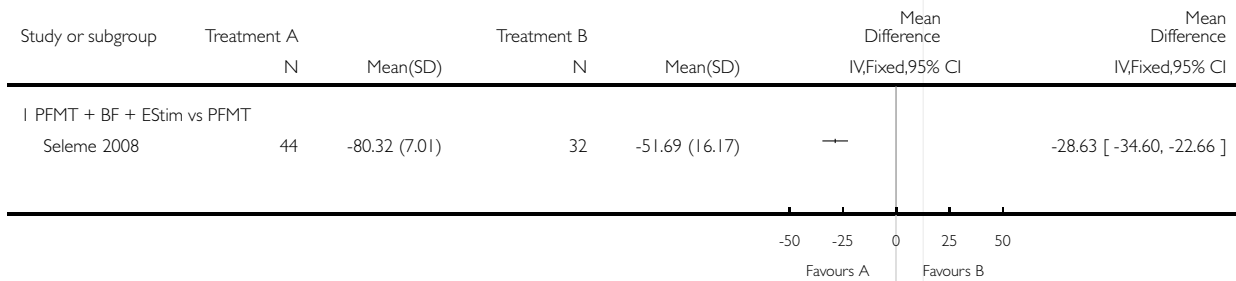


Analysis 5.6. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 6 Quality of Life Score (I-QoL) within 6-12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 6 Quality of Life Score (I-QoL) within 6-12 months

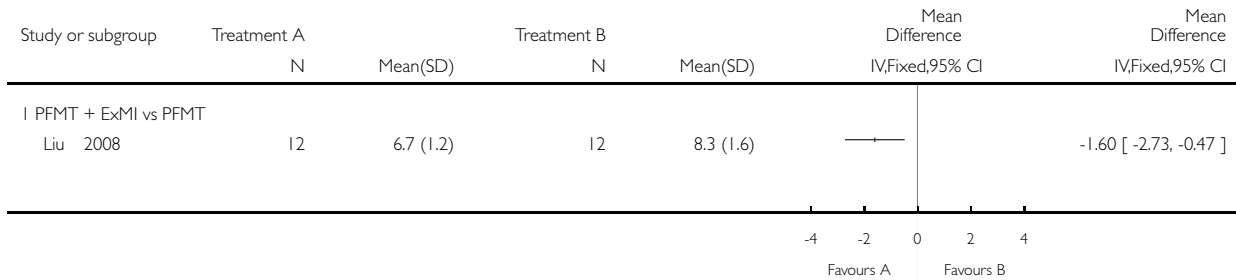


Analysis 5.7. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 7 Quality of Life Score (ICI-Q-SF) within 6-12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 7 Quality of Life Score (ICI-Q-SF) within 6-12 months

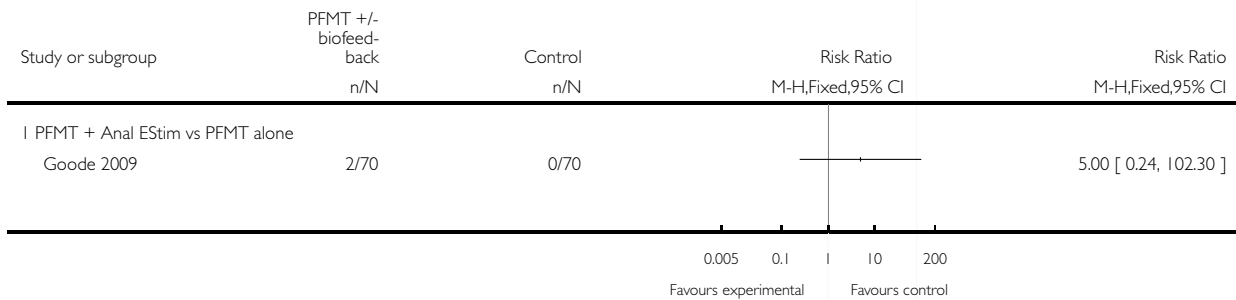


Analysis 5.8. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 8 Adverse events.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 8 Adverse events

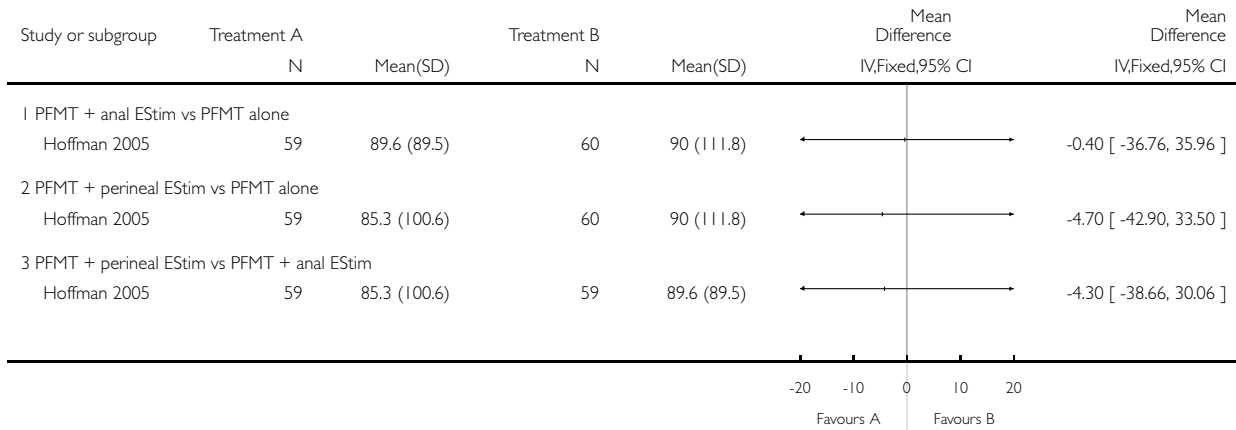


Analysis 5.9. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 9 1 hour pad test (grams of urine lost): at < 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 9 1 hour pad test (grams of urine lost): at < 3 months

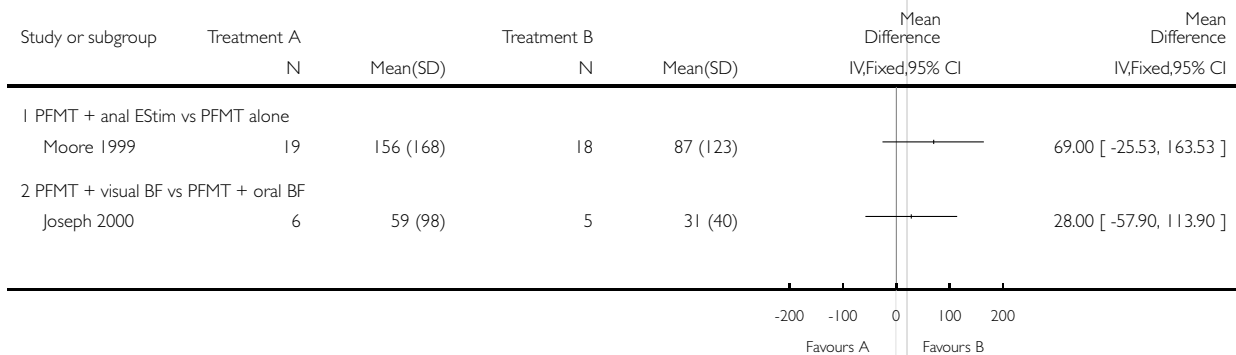


Analysis 5.10. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 10 24 hour pad test (grams of urine lost): at < 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 10 24 hour pad test (grams of urine lost): at < 3 months



Analysis 5.11. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 11 24 hour pad test (grams of urine lost): within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 11 24 hour pad test (grams of urine lost): within 3 to 6 months

Study or subgroup	Treatment A		Treatment B		Mean Difference IV,Fixed,95% CI	Mean Difference IV,Fixed,95% CI
	N	Mean(SD)	N	Mean(SD)		
1 PFMT + anal EStim vs PFMT alone Moore 1999	19	202 (242)	18	74 (131)		128.00 [3.49, 252.51]
2 PFMT + visual BF vs PFMT + oral BF Joseph 2000	5	4 (6)	5	0 (0)		Not estimable

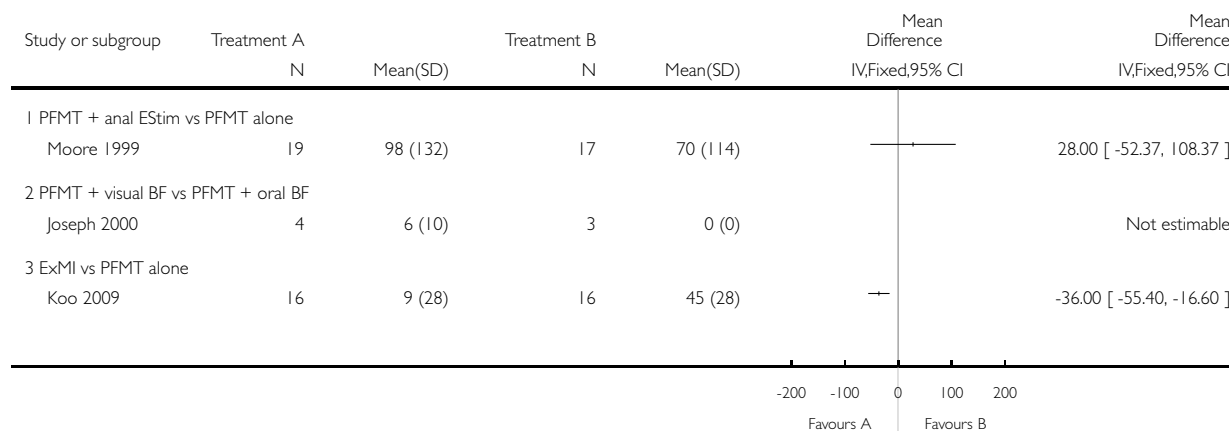
-200 -100 0 100 200
Favours A Favours B

Analysis 5.12. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 12 24 hour pad test (grams of urine lost): within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 12 24 hour pad test (grams of urine lost): within 3 to 6 months

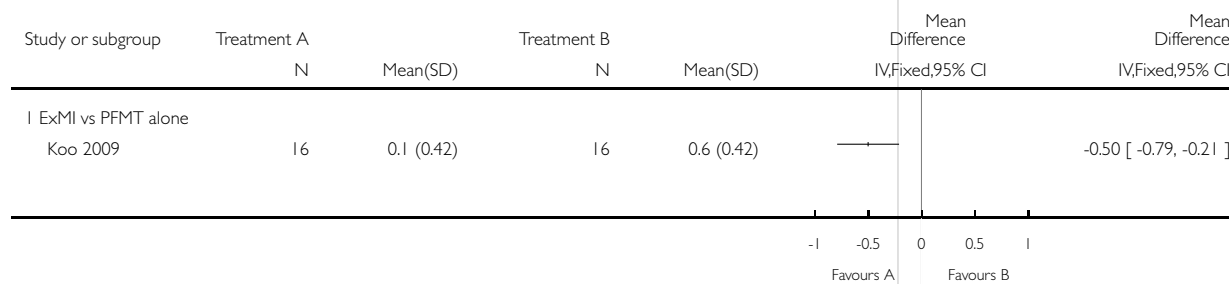


Analysis 5.13. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 13 Pad changes over 24 hours within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 13 Pad changes over 24 hours within 3 to 6 months

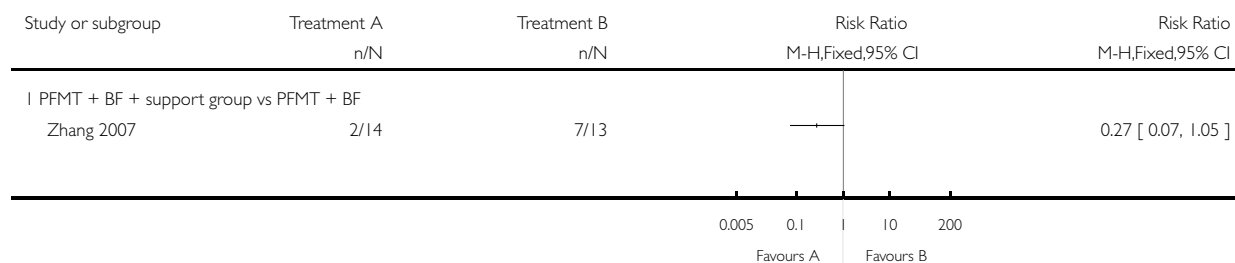


Analysis 5.14. Comparison 5 Treatment of UI after radical: one active treatment versus another active treatment, Outcome 14 Number of men not carrying out sufficient PFMT within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 5 Treatment of UI after radical: one active treatment versus another active treatment

Outcome: 14 Number of men not carrying out sufficient PFMT within 3 to 6 months

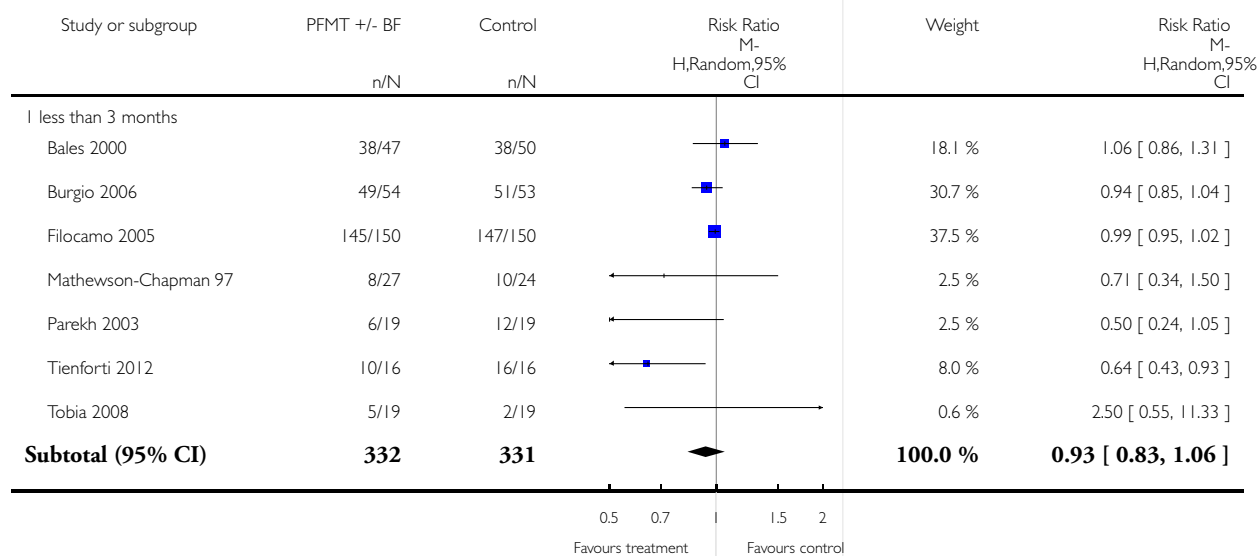


Analysis 6.1. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 1 Number of incontinent men.

Review: Conservative management for postprostatectomy urinary incontinence

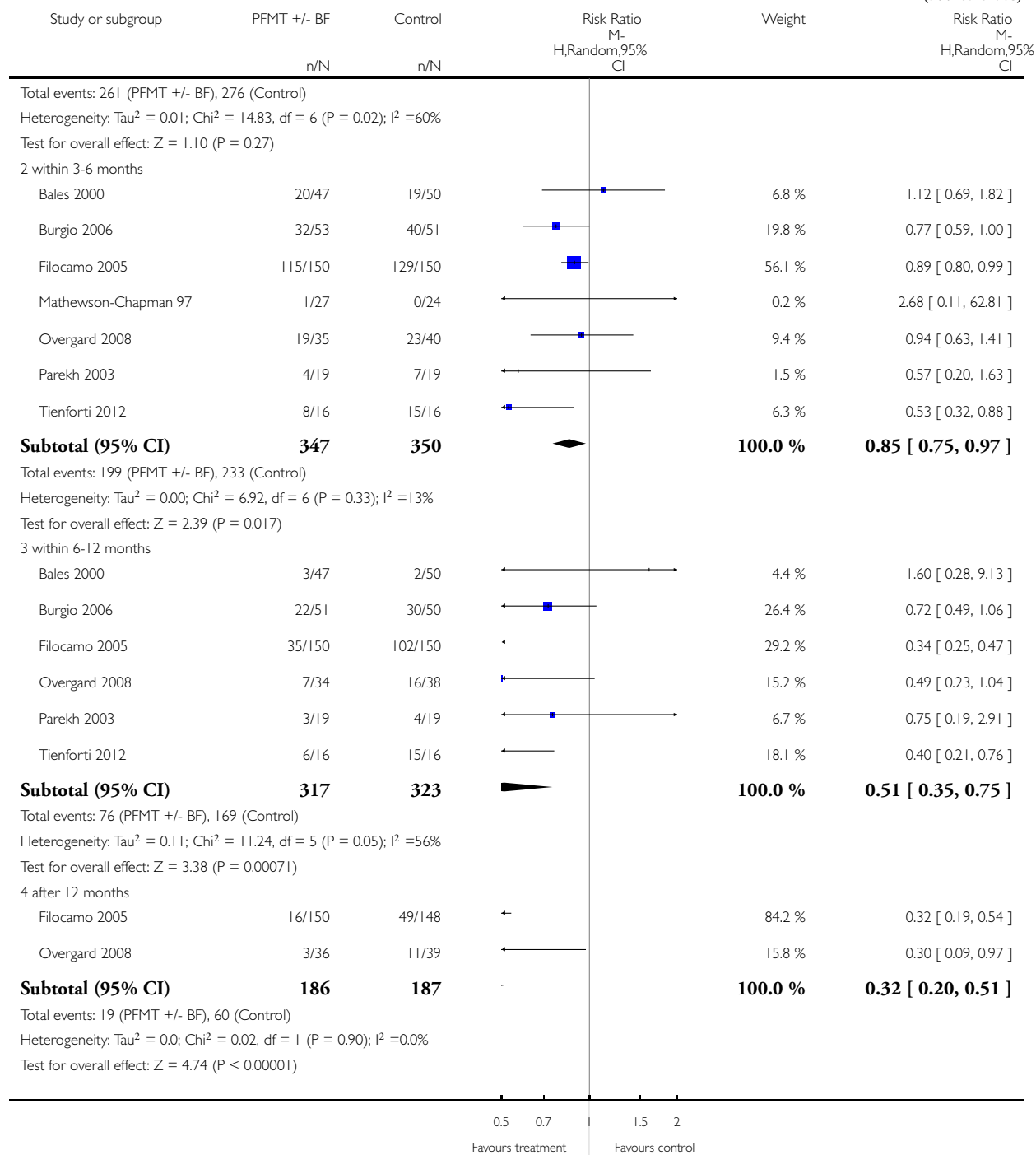
Comparison: 6 Prevention of UI after radical: PFMT biofeedback versus no treatment

Outcome: 1 Number of incontinent men



(Continued ...)

(... Continued)

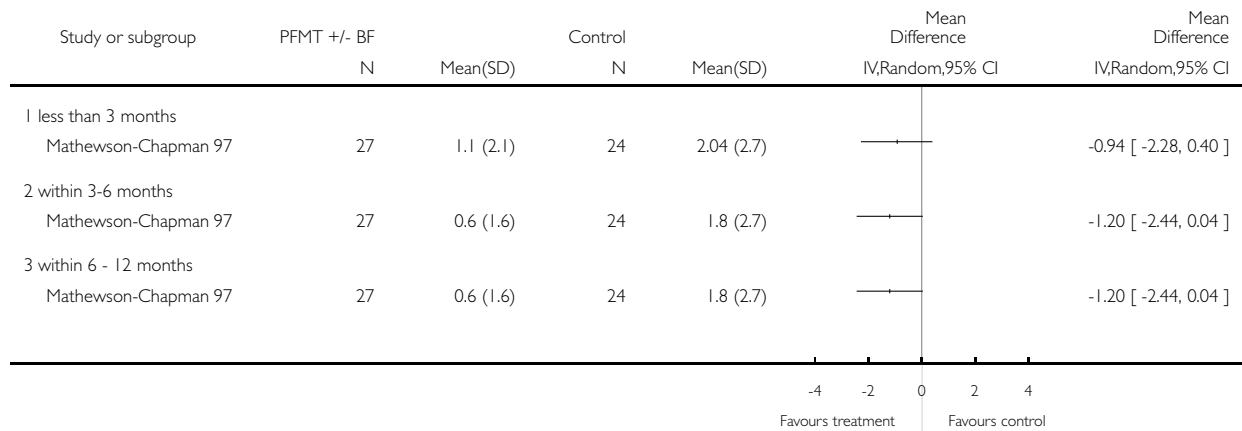


Analysis 6.2. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 2 Pad changes over 24 hours.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 6 Prevention of UI after radical: PFMT biofeedback versus no treatment

Outcome: 2 Pad changes over 24 hours

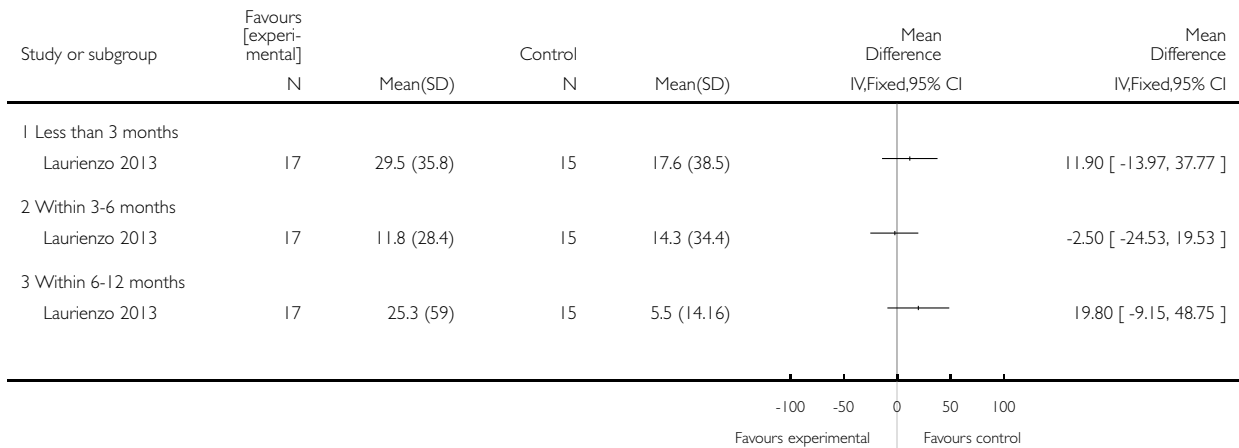


Analysis 6.3. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 3 1 hour pad test (grams of urine lost).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 6 Prevention of UI after radical: PFMT biofeedback versus no treatment

Outcome: 3 1 hour pad test (grams of urine lost)

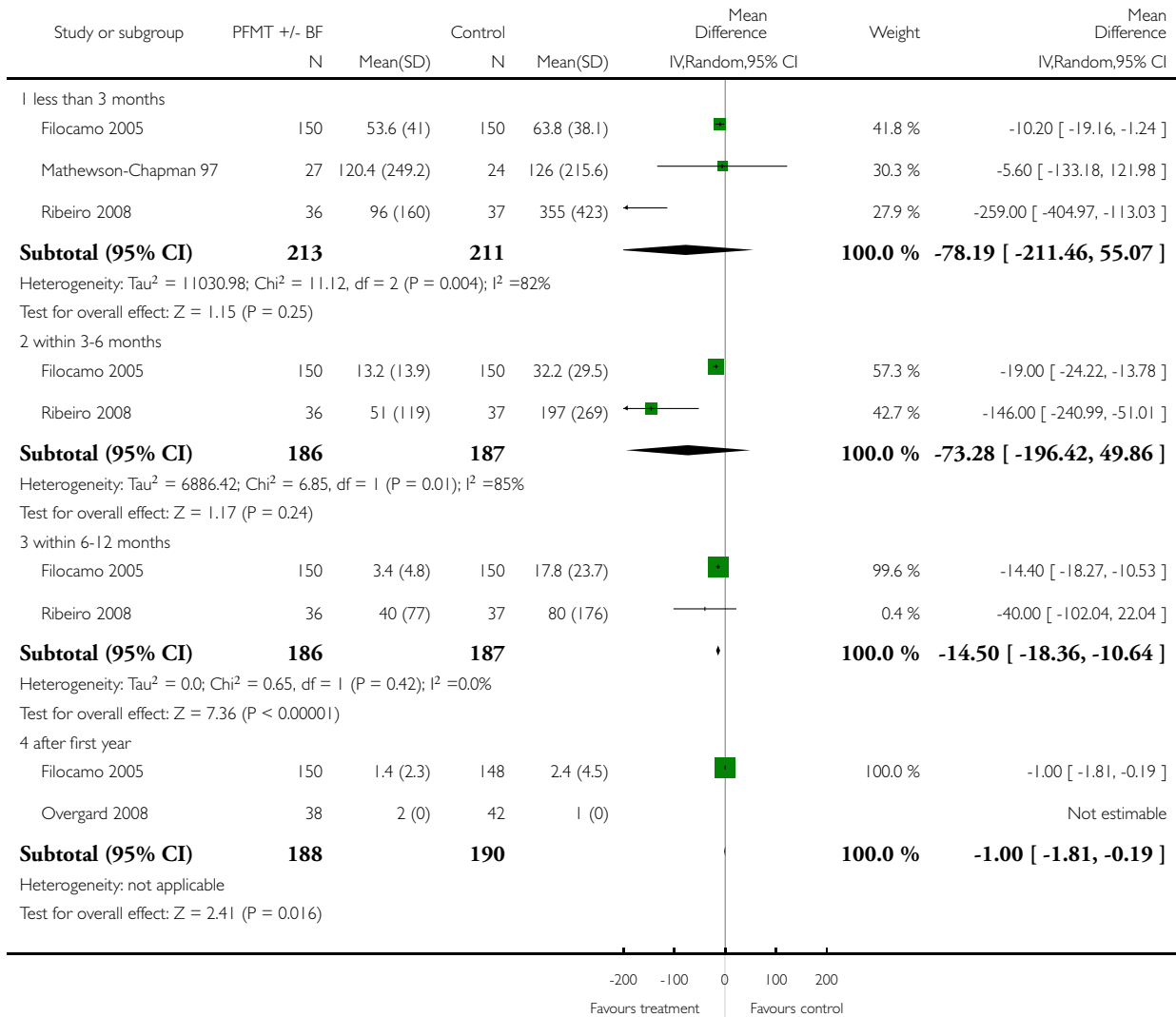


Analysis 6.4. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 4 24 hour pad test (gm/24hrs).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 6 Prevention of UI after radical: PFMT biofeedback versus no treatment

Outcome: 4 24 hour pad test (gm/24hrs)

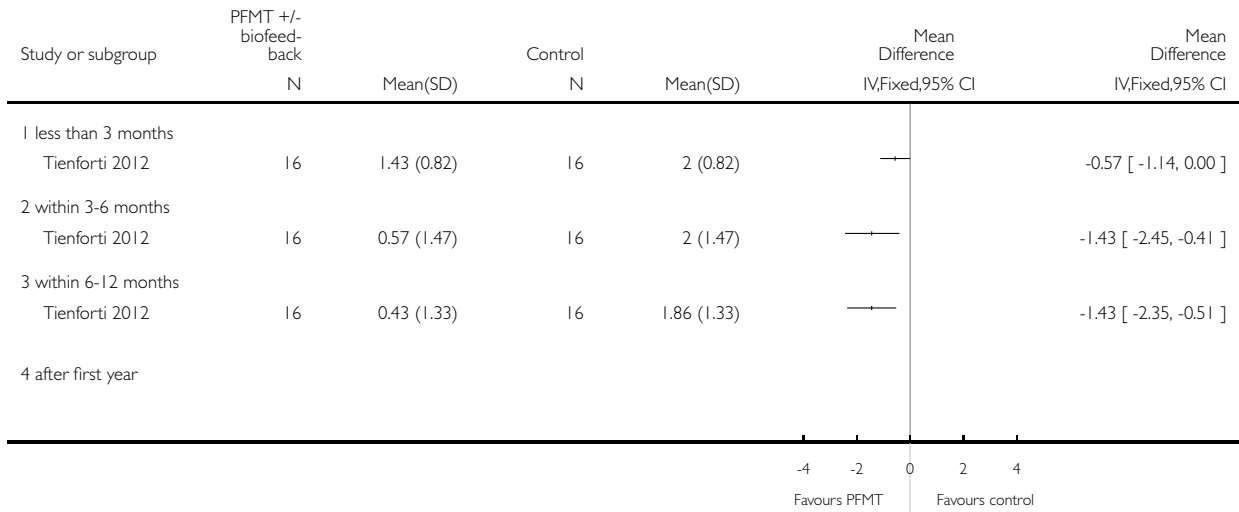


Analysis 6.5. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 5 Number of incontinence episodes per day.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 6 Prevention of UI after radical: PFMT biofeedback versus no treatment

Outcome: 5 Number of incontinence episodes per day

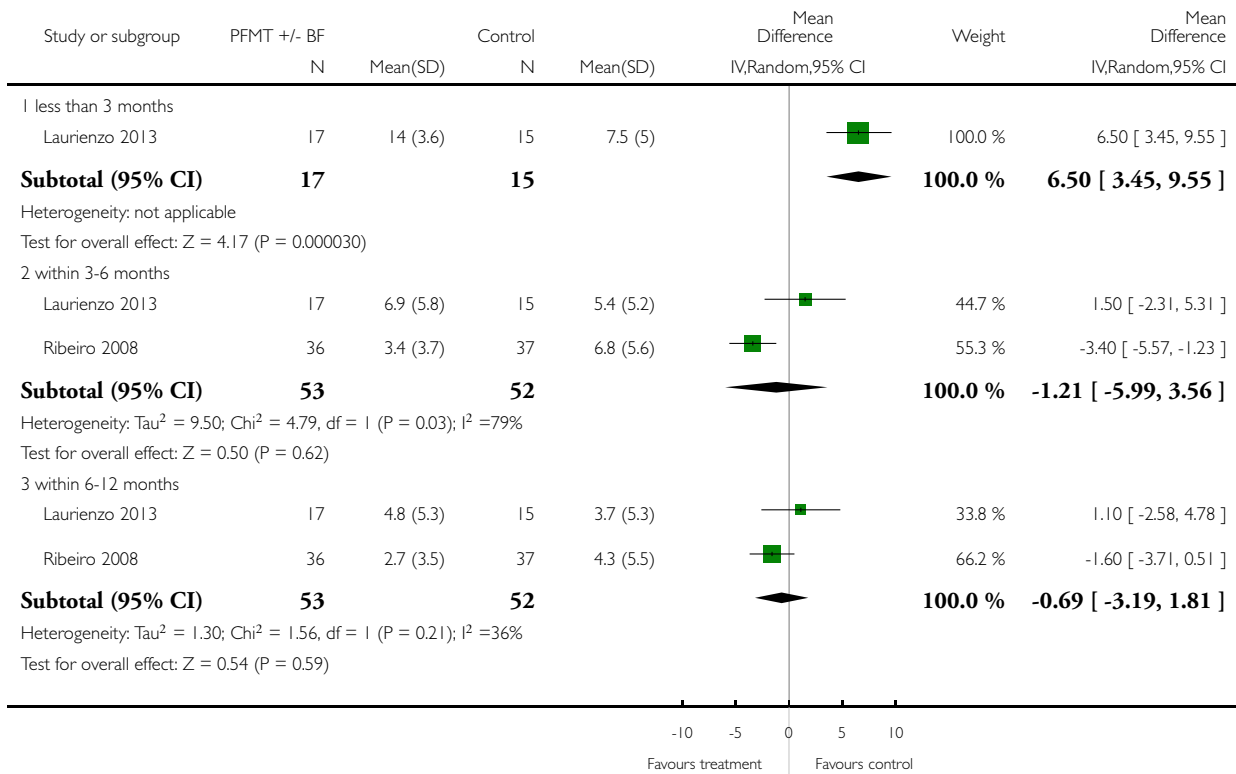


Analysis 6.6. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 6 Urinary Incontinence Score (ICI-short form).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment

Outcome: 6 Urinary Incontinence Score (ICI-short form)

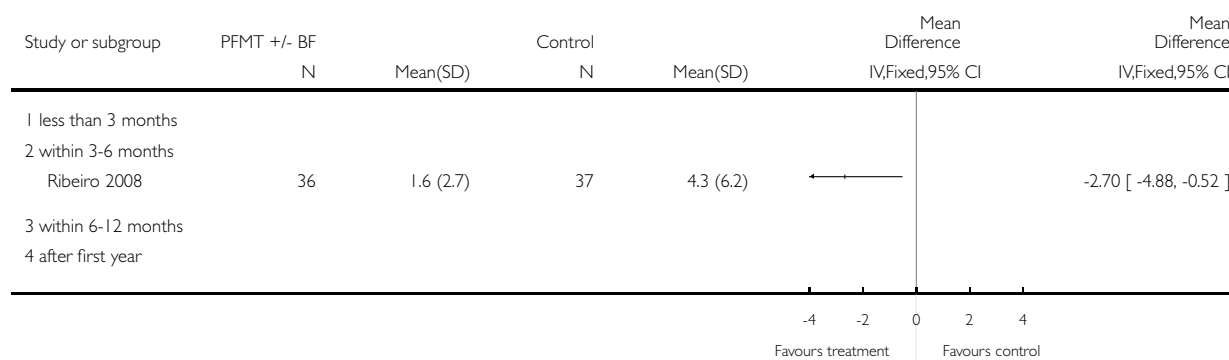


Analysis 6.7. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 7 Quality of Life Score (IIQ).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 6 Prevention of UI after radical: PFMT biofeedback versus no treatment

Outcome: 7 Quality of Life Score (IIQ)

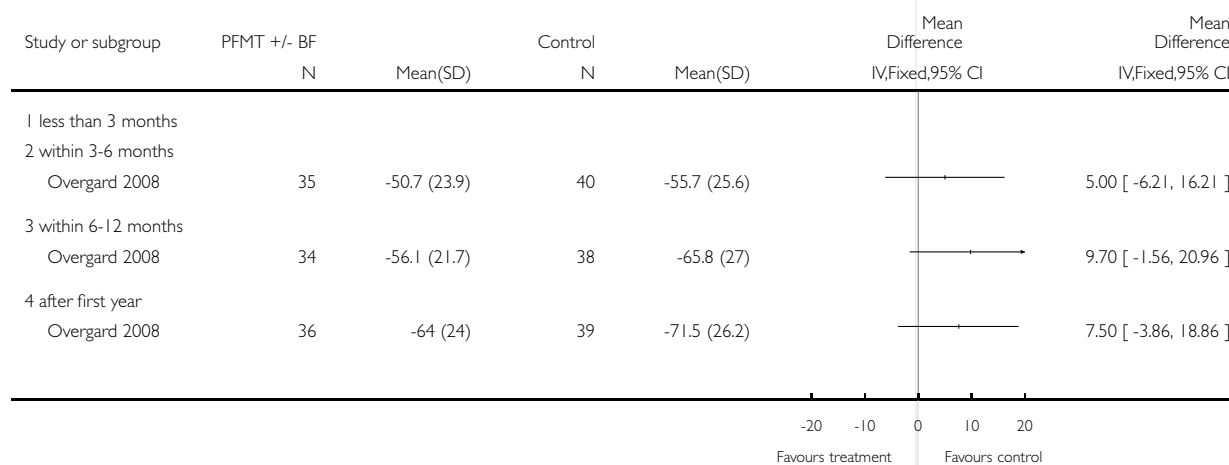


Analysis 6.8. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 8 Pelvic floor muscle strength (anal squeeze pressure, cm H₂O).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 6 Prevention of UI after radical: PFMT biofeedback versus no treatment

Outcome: 8 Pelvic floor muscle strength (anal squeeze pressure, cm H₂O)

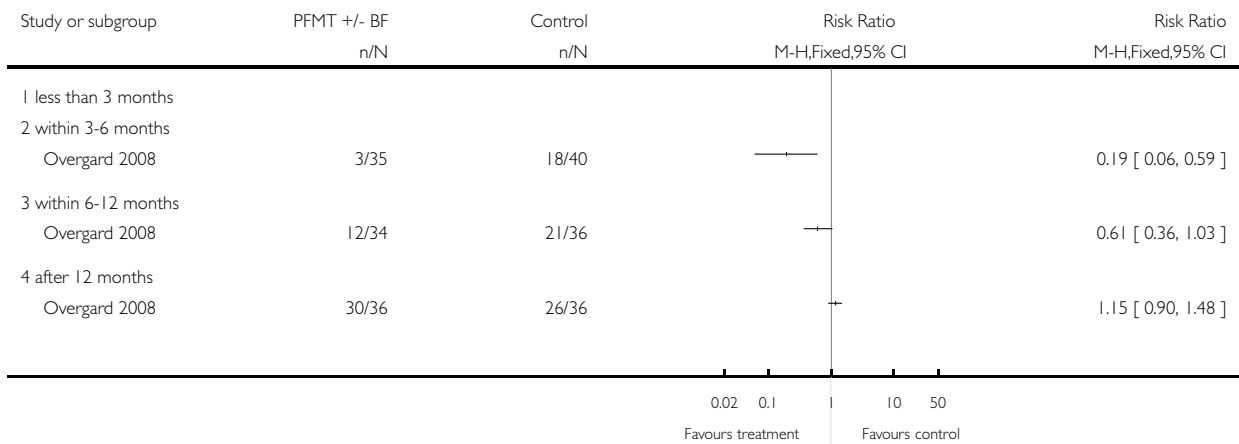


Analysis 6.9. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 9 Number of men not carrying out sufficient PFMT.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 6 Prevention of UI after radical: PFMT biofeedback versus no treatment

Outcome: 9 Number of men not carrying out sufficient PFMT

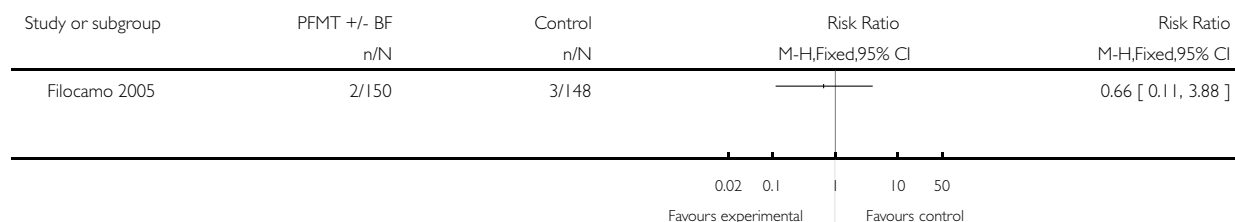


Analysis 6.10. Comparison 6 Prevention of UI after radical: PFMT ± biofeedback versus no treatment, Outcome 10 Number of men having surgery for incontinence.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 6 Prevention of UI after radical: PFMT biofeedback versus no treatment

Outcome: 10 Number of men having surgery for incontinence

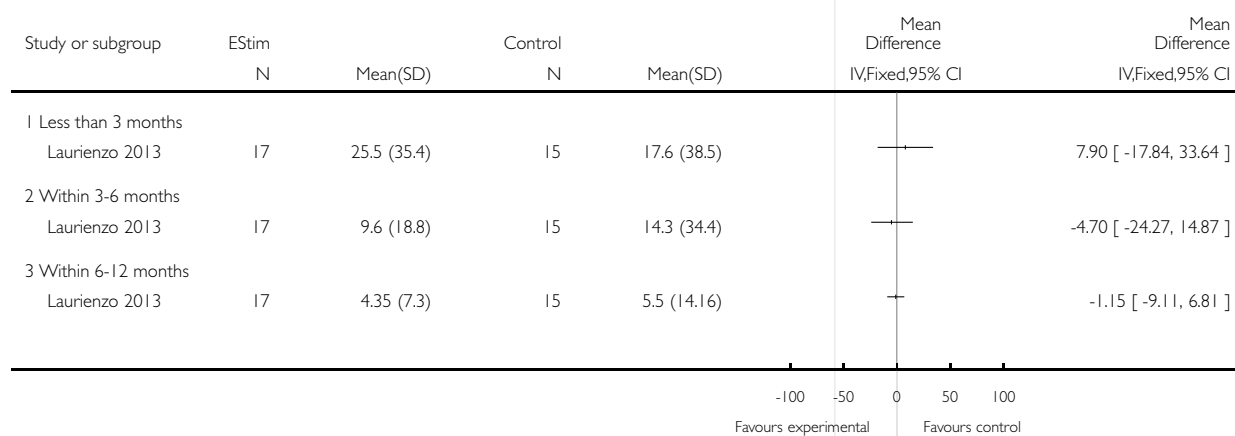


Analysis 7.1. Comparison 7 Prevention of UI after radical: electric or magnetic energy versus no treatment, Outcome 1 1 hour pad test (grams of urine lost).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 7 Prevention of UI after radical: electric or magnetic energy versus no treatment

Outcome: 1 1 hour pad test (grams of urine lost)

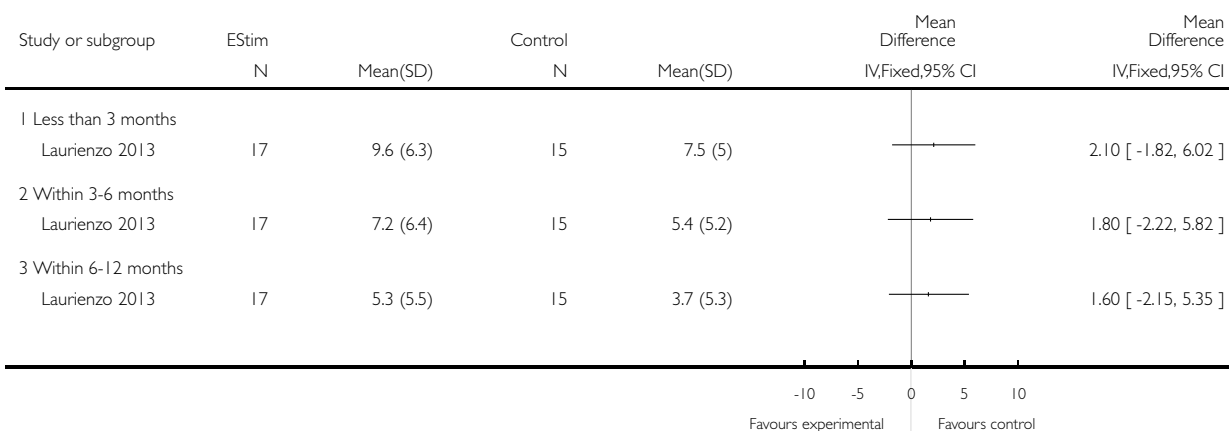


Analysis 7.2. Comparison 7 Prevention of UI after radical: electric or magnetic energy versus no treatment, Outcome 2 ICIQ-SF score.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 7 Prevention of UI after radical: electric or magnetic energy versus no treatment

Outcome: 2 ICIQ-SF score

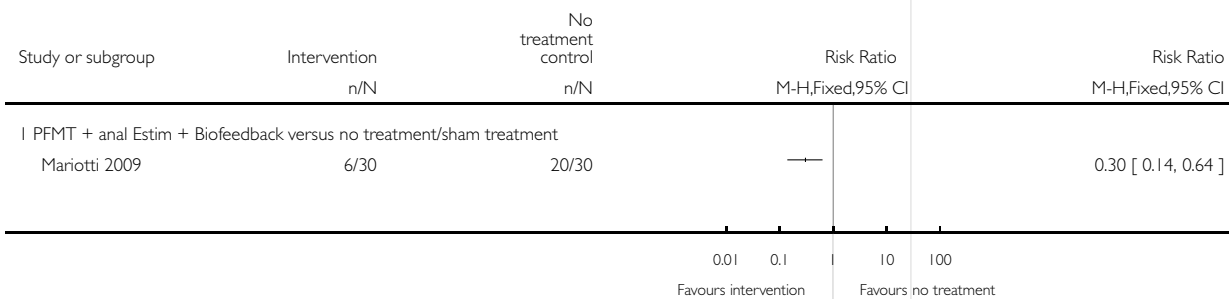


Analysis 9.1. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 1 Number of incontinent men within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 9 Prevention of UI after radical: combinations of treatments versus no treatment

Outcome: 1 Number of incontinent men within 3 to 6 months

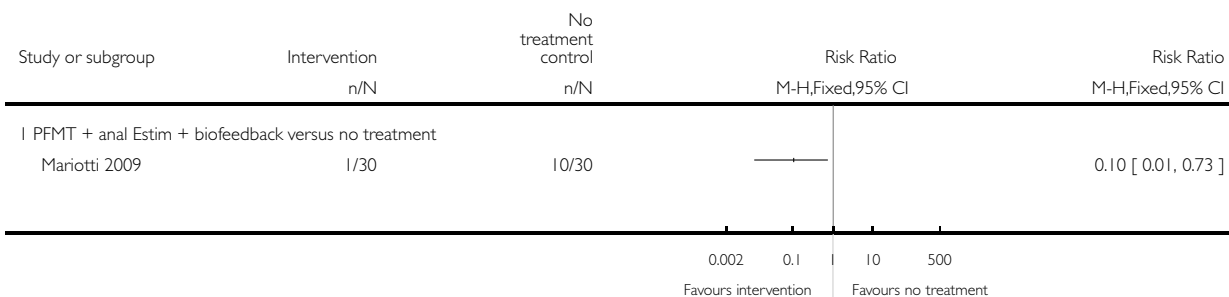


Analysis 9.2. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 2 Number of incontinent men within 6 to 12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 9 Prevention of UI after radical: combinations of treatments versus no treatment

Outcome: 2 Number of incontinent men within 6 to 12 months

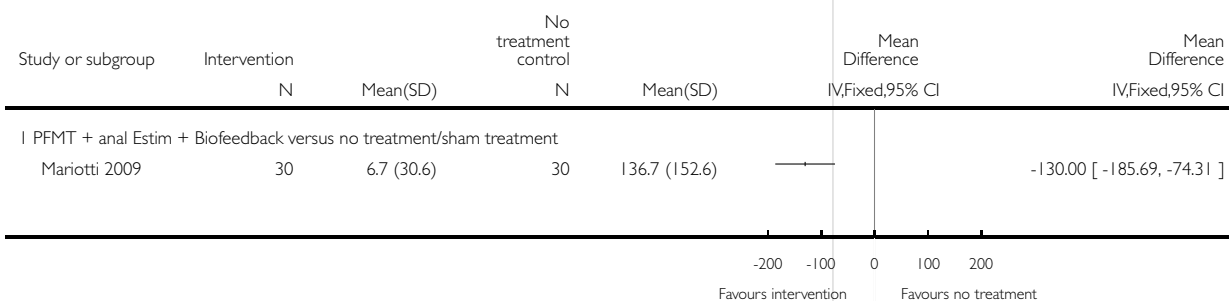


Analysis 9.3. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 3 24 hour pad test (grams of urine lost) within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 9 Prevention of UI after radical: combinations of treatments versus no treatment

Outcome: 3 24 hour pad test (grams of urine lost) within 3 to 6 months

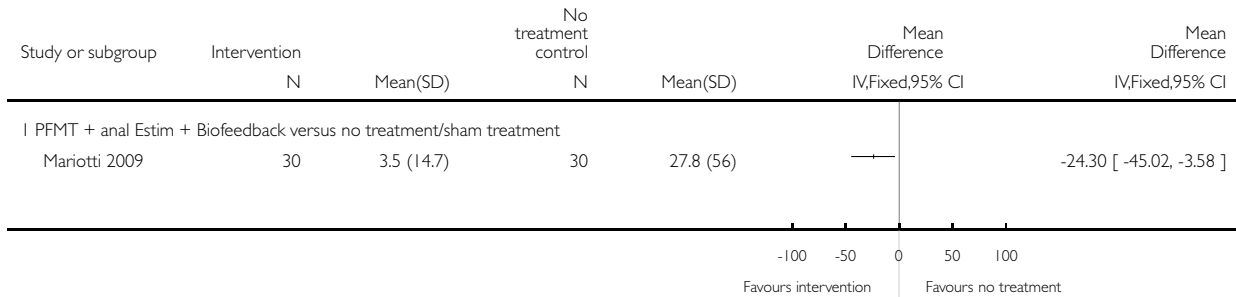


Analysis 9.4. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 4 24 hour pad test (grams of urine lost) 6 to 12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 9 Prevention of UI after radical: combinations of treatments versus no treatment

Outcome: 4 24 hour pad test (grams of urine lost) 6 to 12 months

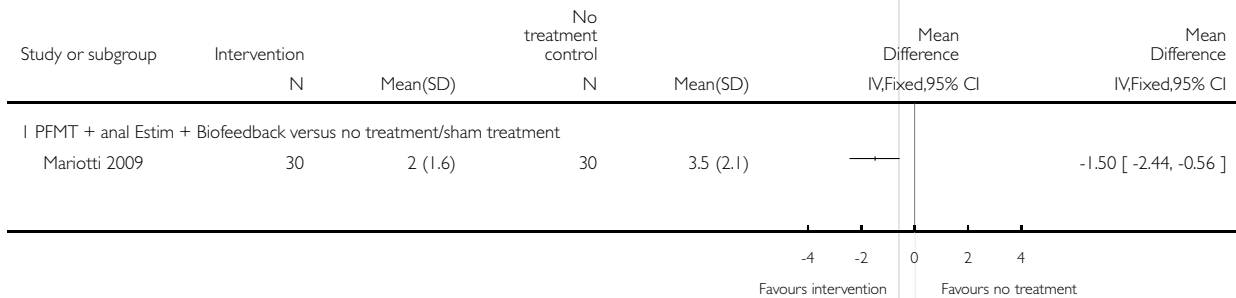


Analysis 9.5. Comparison 9 Prevention of UI after radical: combinations of treatments versus no treatment, Outcome 5 Time until continent (months).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 9 Prevention of UI after radical: combinations of treatments versus no treatment

Outcome: 5 Time until continent (months)

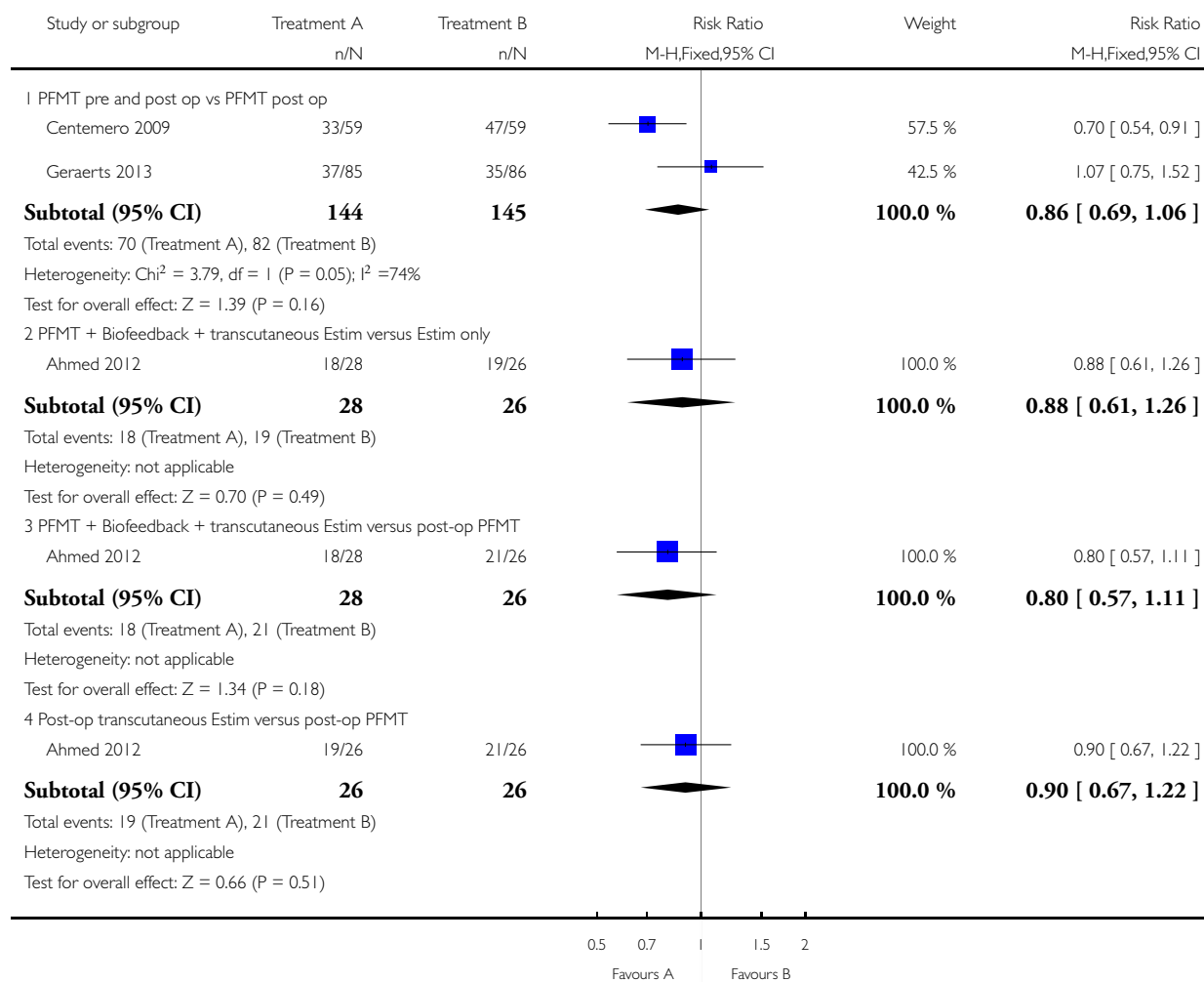


Analysis 10.1. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 1 Number of incontinent men at < 3months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 1 Number of incontinent men at < 3months

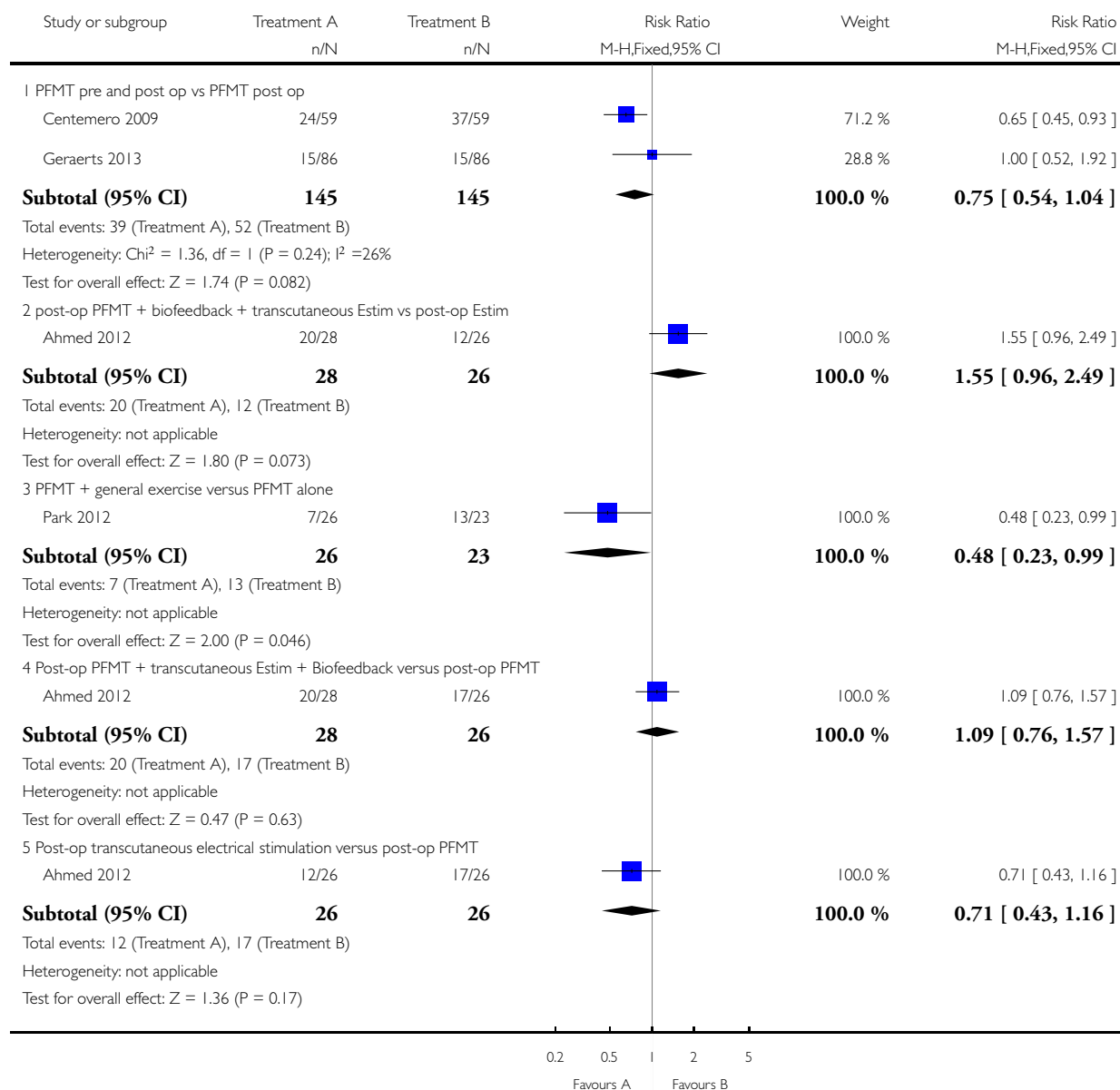


Analysis 10.2. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 2 Number of incontinent men within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 2 Number of incontinent men within 3 to 6 months

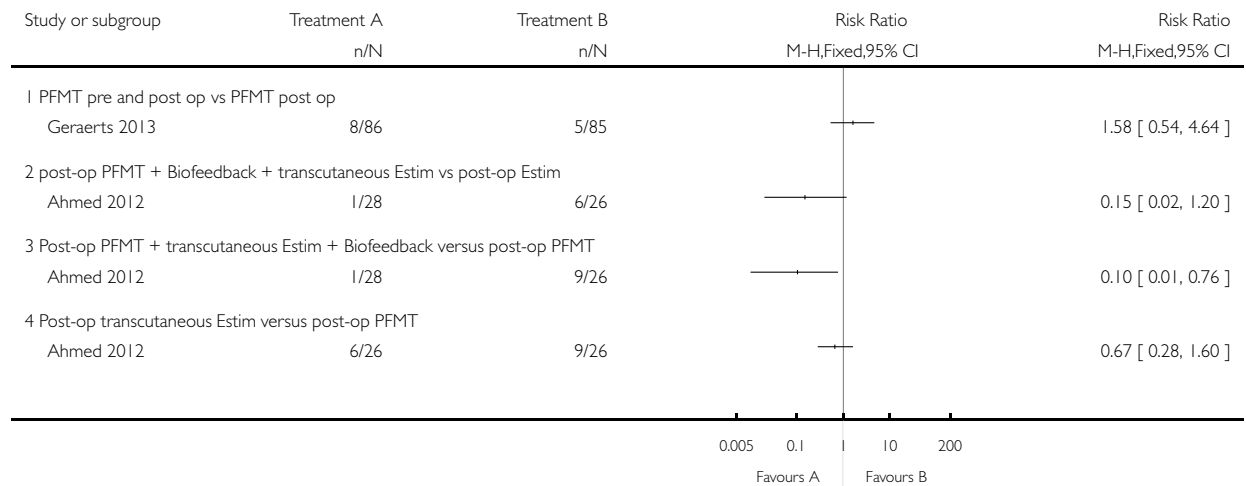


Analysis 10.3. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 3 Number of incontinent men within 6 to 12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 3 Number of incontinent men within 6 to 12 months

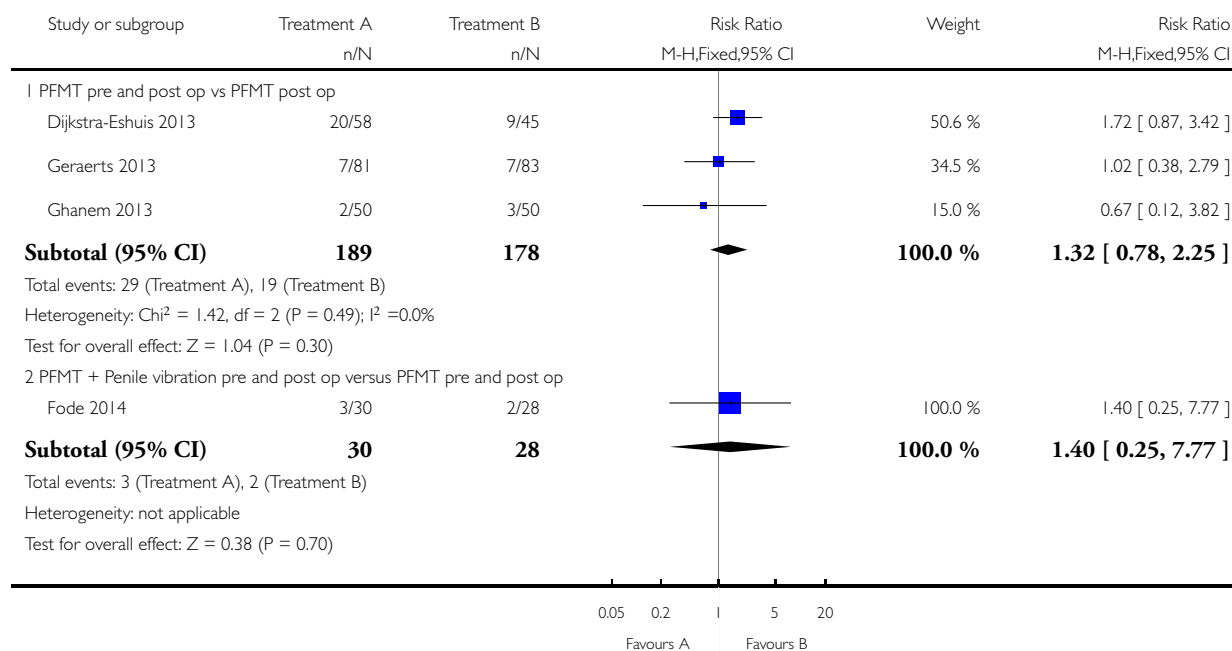


Analysis 10.4. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 4 Number of incontinent men after 12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 4 Number of incontinent men after 12 months

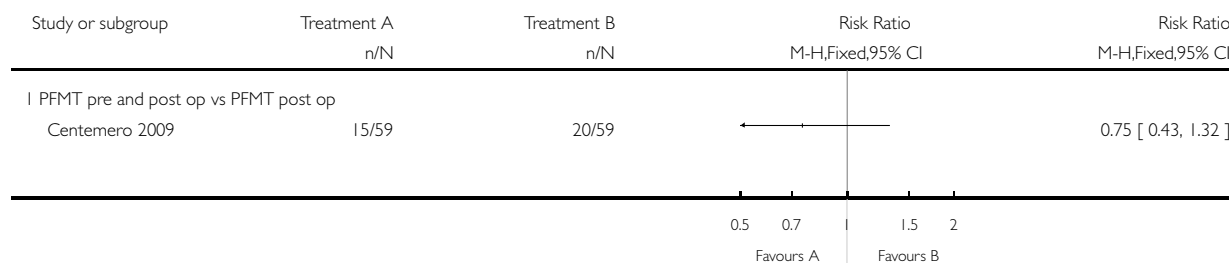


Analysis 10.5. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 5 No. with severe incontinence (e.g. pad test weight >150g) at < 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 5 No. with severe incontinence (e.g. pad test weight >150g) at < 3 months

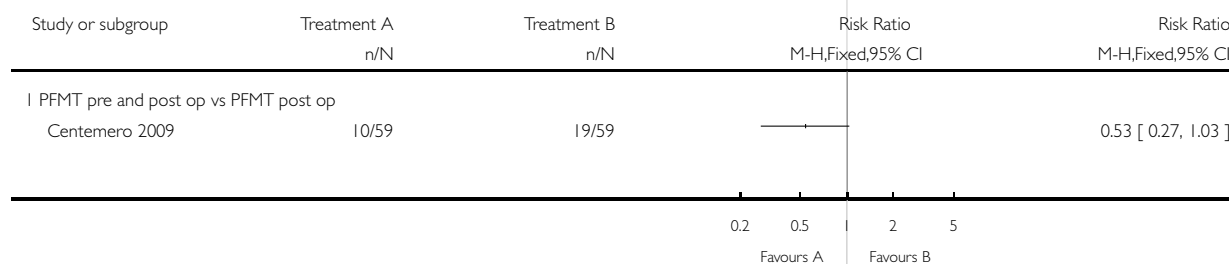


Analysis 10.6. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 6 No. with severe incontinence (e.g. pad test weight >150g) at 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 6 No. with severe incontinence (e.g. pad test weight >150g) at 3 to 6 months

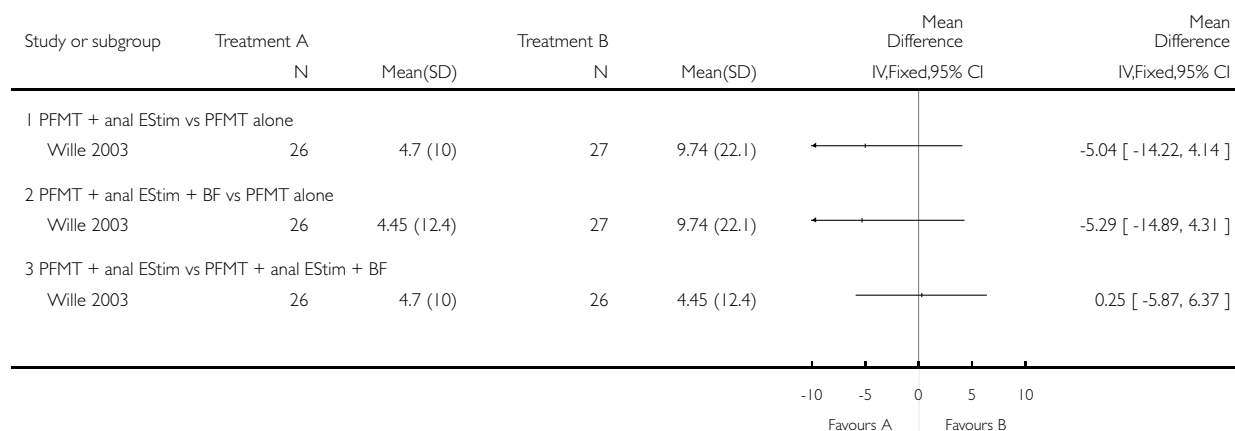


Analysis 10.7. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 7 20 minute pad test (grams of urine lost): within 3 to 6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 7 20 minute pad test (grams of urine lost); within 3 to 6 months

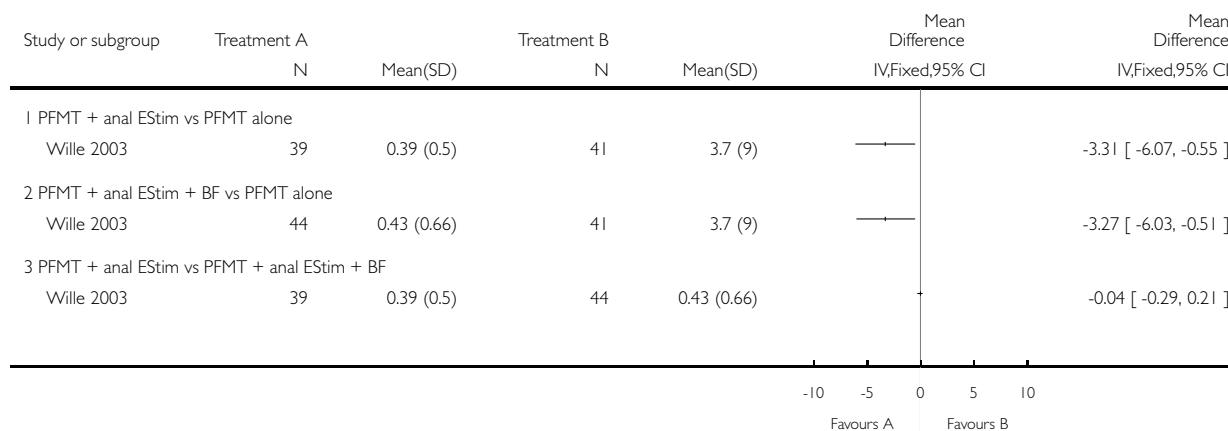


Analysis 10.8. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 8 20 minute pad test (grams of urine lost): within 6 to 12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 8 20 minute pad test (grams of urine lost): within 6 to 12 months

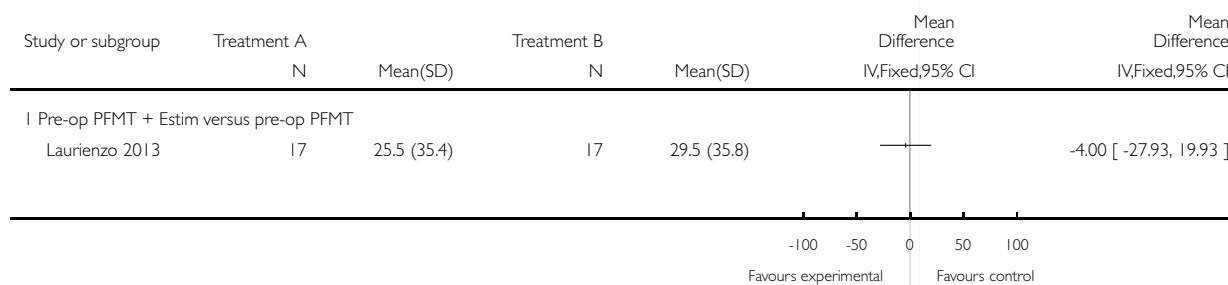


Analysis 10.9. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 9 1 hour pad test (grams of urine lost) at less than 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 9 1 hour pad test (grams of urine lost) at less than 3 months

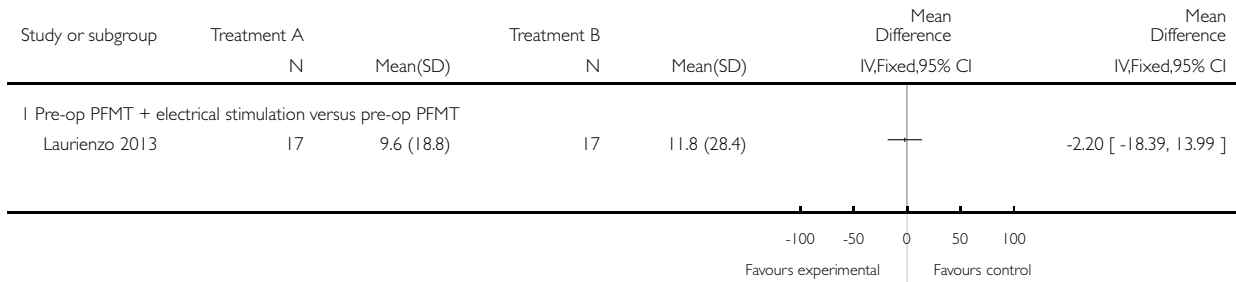


Analysis 10.10. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 10 1 hour pad test (grams of urine lost) within 3-6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 10 1 hour pad test (grams of urine lost) within 3-6 months

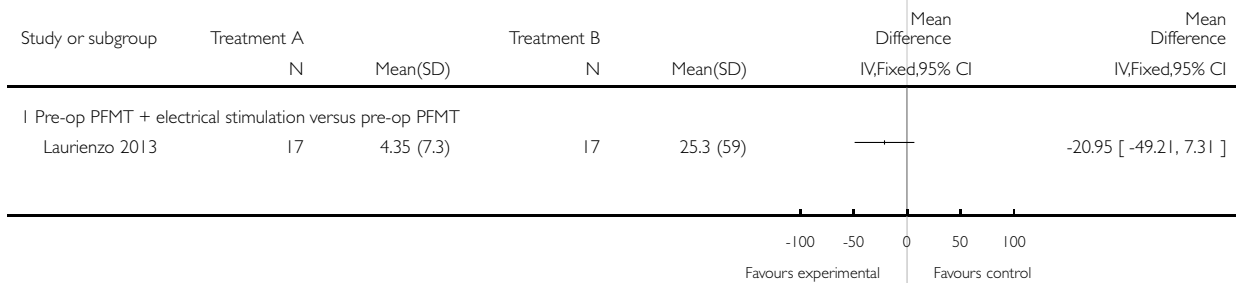


Analysis 10.11. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 11 1 hour pad test within 6-12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 11 1 hour pad test within 6-12 months

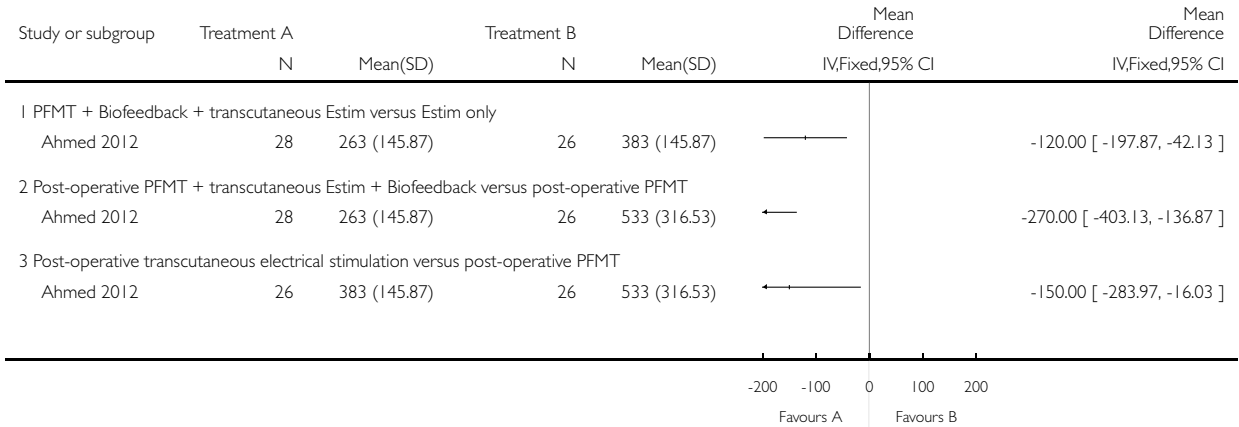


Analysis 10.12. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 12 24 hour pad test (grams of urine lost) at less than 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 12 24 hour pad test (grams of urine lost) at less than 3 months

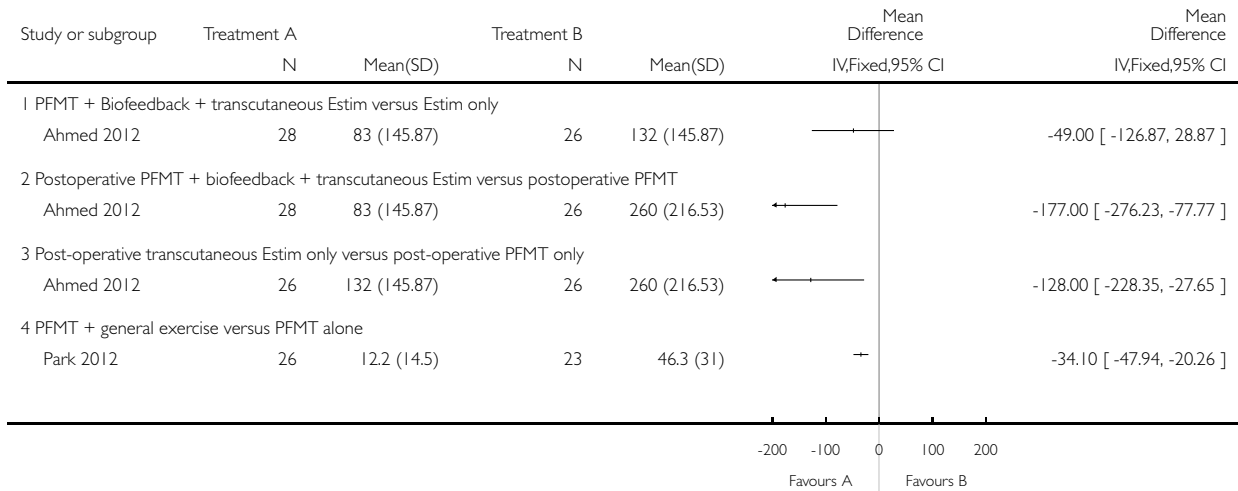


Analysis 10.13. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 13 24 hour pad test (grams of urine lost) within 3-6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 13 24 hour pad test (grams of urine lost) within 3-6 months

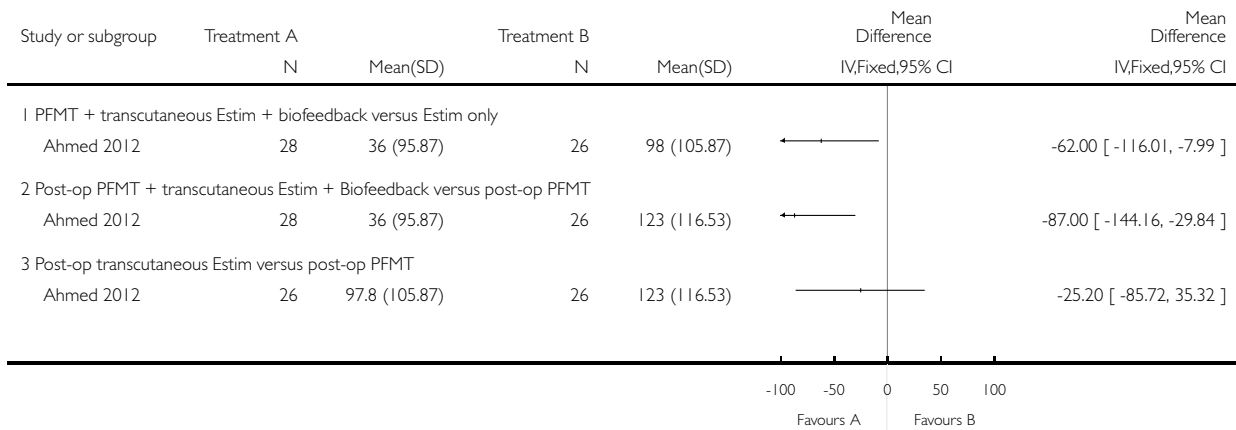


Analysis 10.14. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 14 24 hour pad test (grams of urine lost) within 6-12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 14 24 hour pad test (grams of urine lost) within 6-12 months

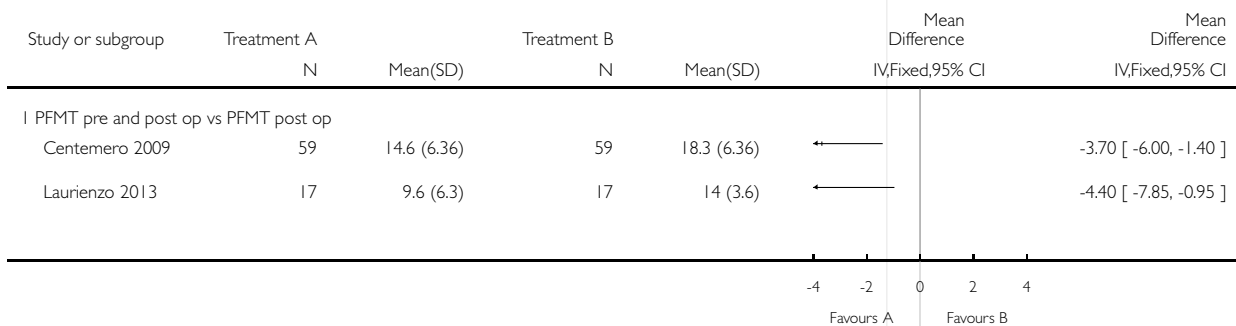


Analysis 10.15. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 15 Quality of Life Score (ICS male short form) at < 3 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 15 Quality of Life Score (ICS male short form) at < 3 months

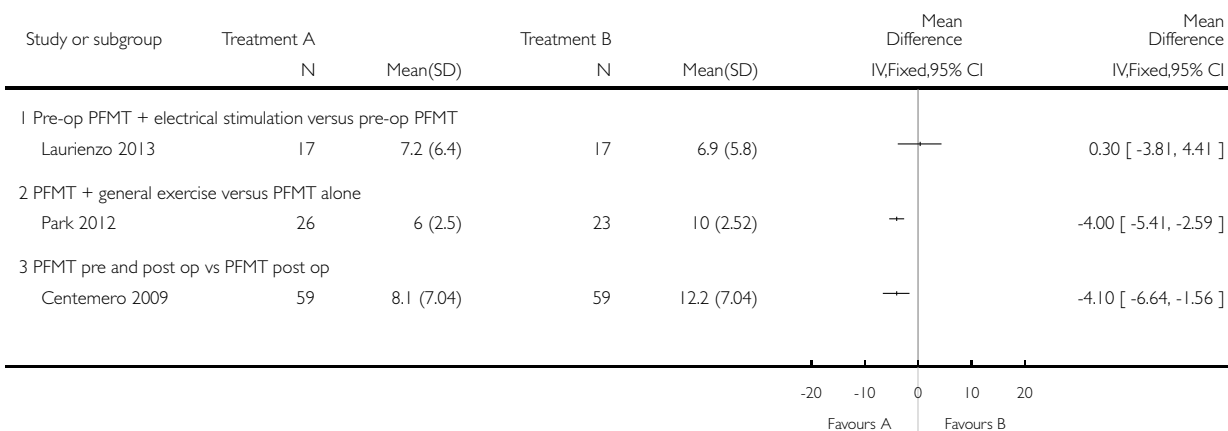


Analysis 10.16. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 16 Urinary Incontinence Quality of Life Score (ICIQ - short form) within 3-6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 16 Urinary Incontinence Quality of Life Score (ICIQ - short form) within 3-6 months

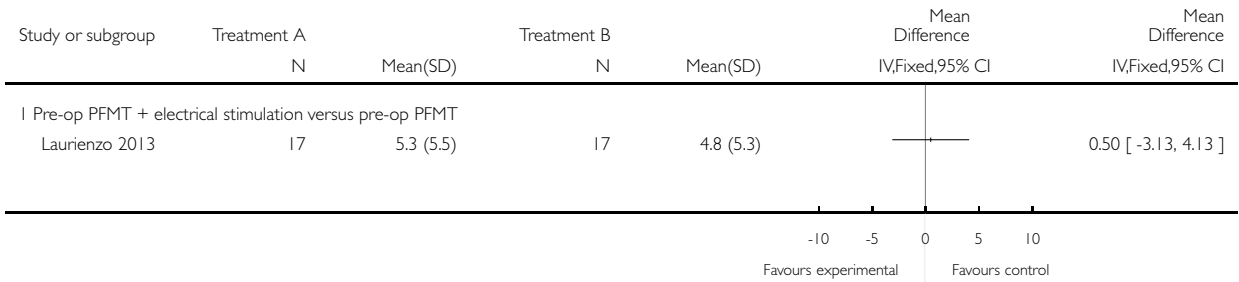


Analysis 10.17. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 17 Urinary Incontinence Quality of Life Score (ICIQ-short form) within 6-12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 17 Urinary Incontinence Quality of Life Score (ICIQ-short form) within 6-12 months

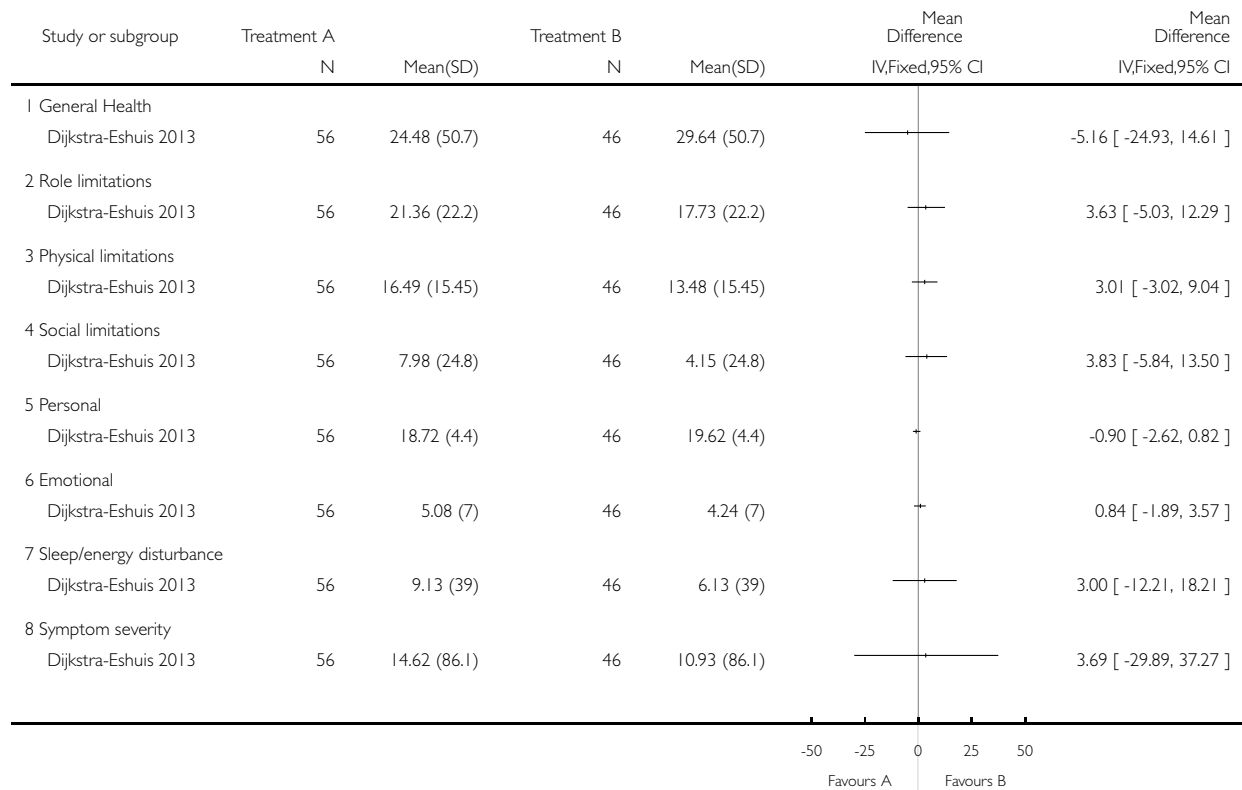


Analysis 10.18. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 18 King's health Questionnaire after 12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 18 King's health Questionnaire after 12 months

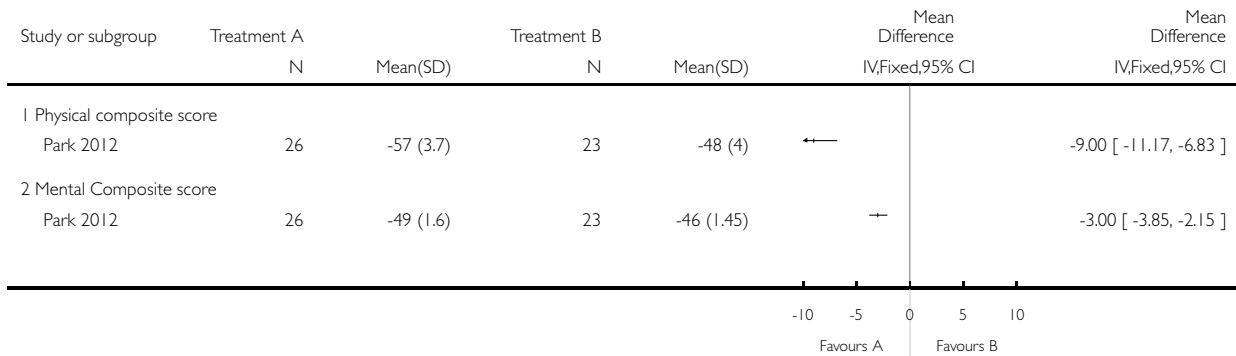


Analysis 10.19. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 19 Health status measure SF-36 within 3-6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 19 Health status measure SF-36 within 3-6 months

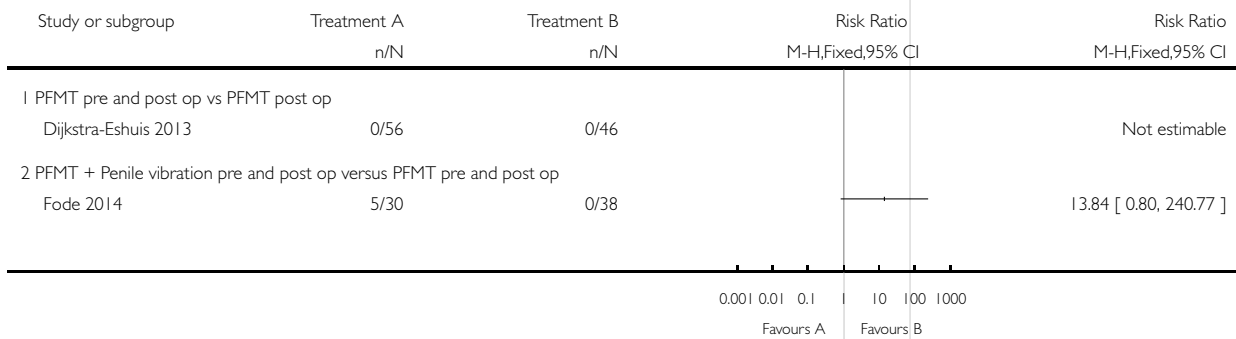


Analysis 10.20. Comparison 10 Prevention of UI after radical: one active treatment versus another active treatment, Outcome 20 Adverse events.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 10 Prevention of UI after radical: one active treatment versus another active treatment

Outcome: 20 Adverse events

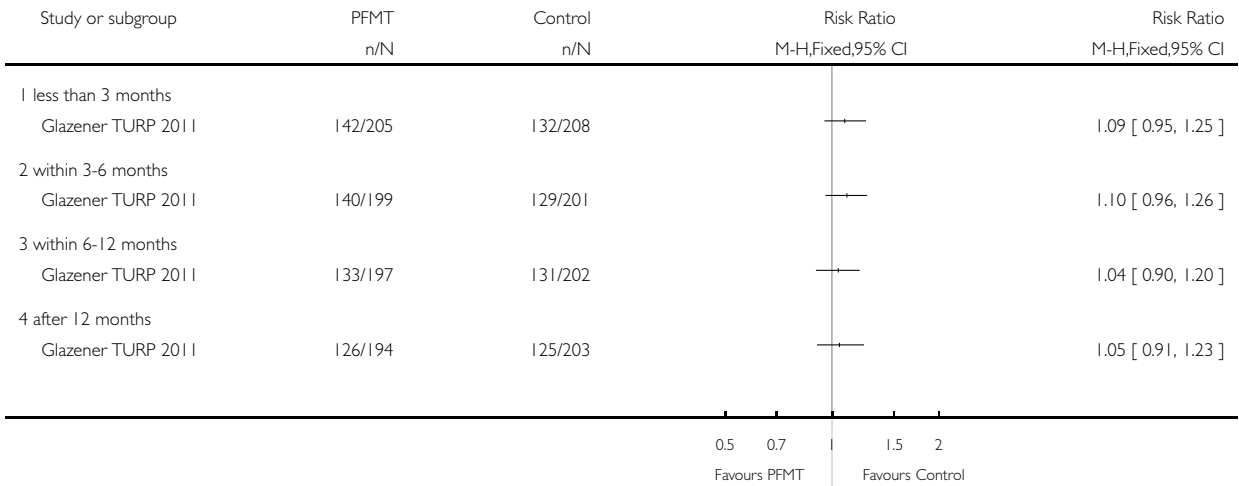


Analysis 11.1. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 1 Number of incontinent men.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 11 Treatment of UI after TURP: PFMT biofeedback versus no treatment

Outcome: 1 Number of incontinent men

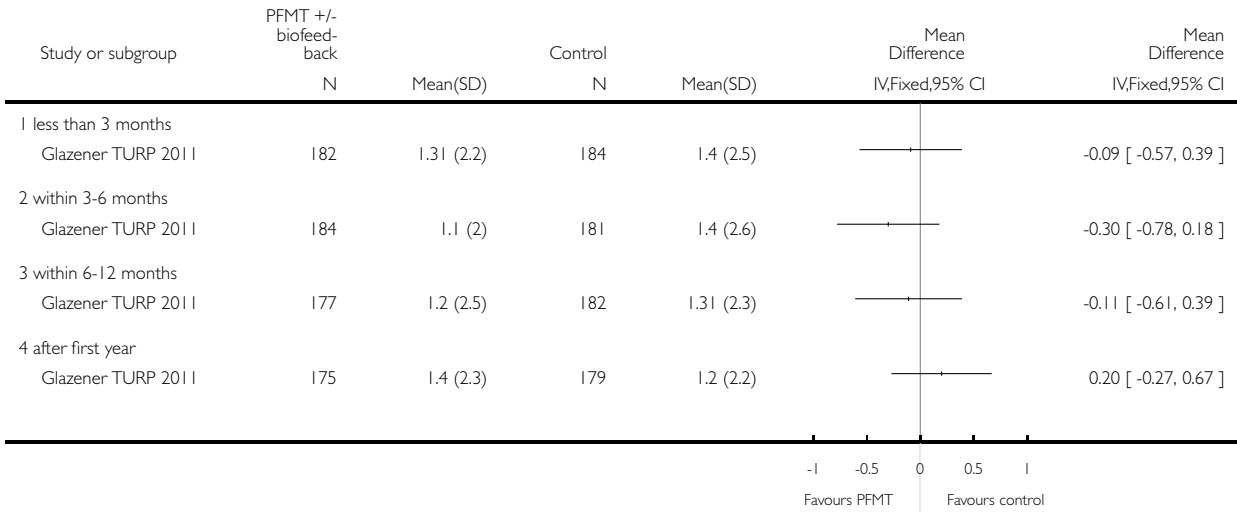


Analysis 11.2. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 2 Number of incontinence episodes per day.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment

Outcome: 2 Number of incontinence episodes per day

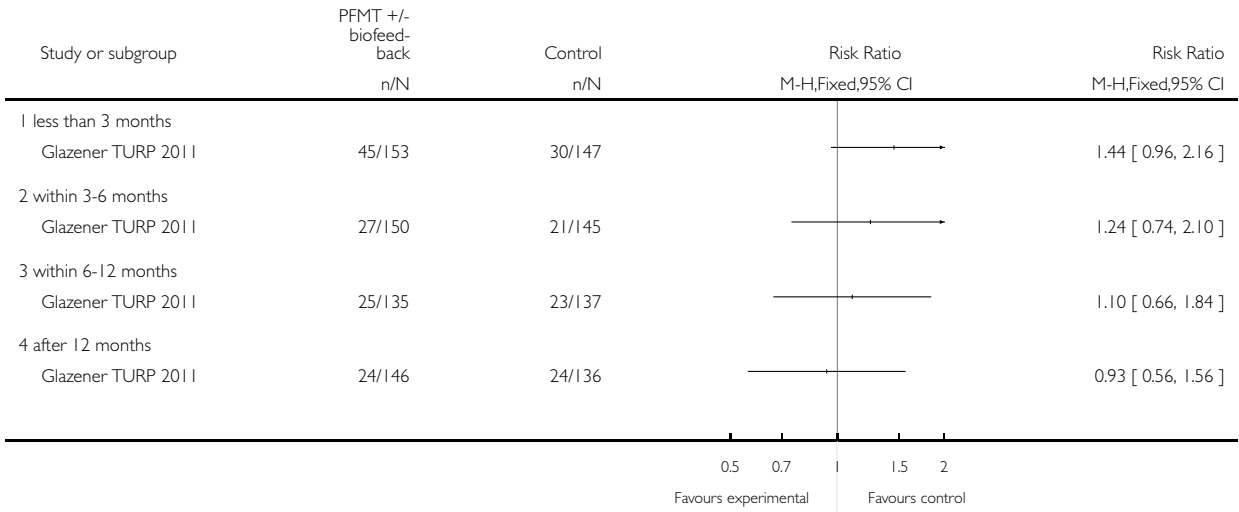


Analysis 11.3. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 3 Number of men using pads.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment

Outcome: 3 Number of men using pads

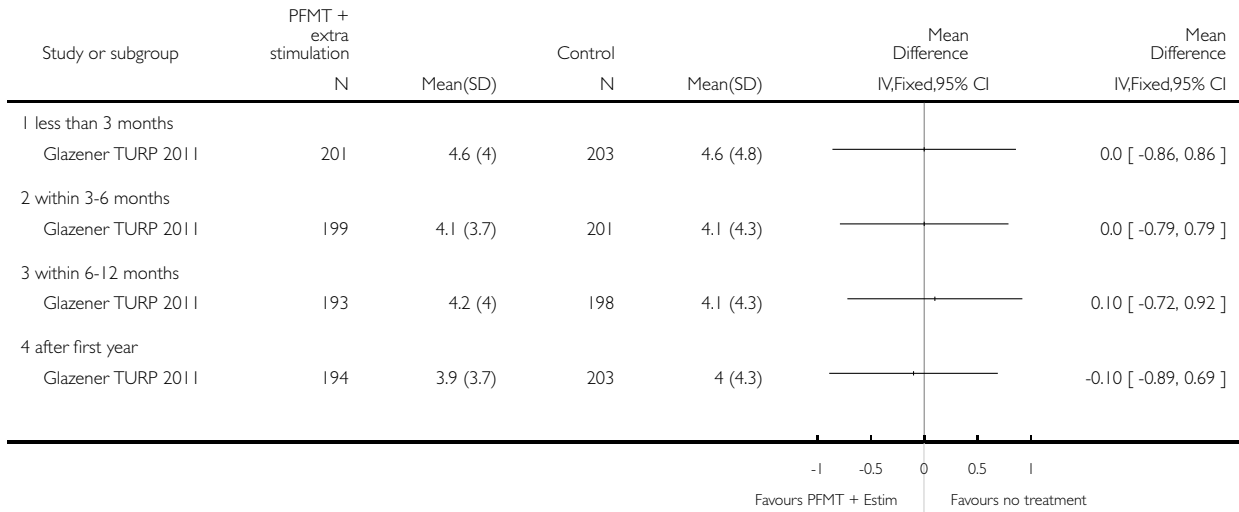


Analysis 11.4. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 4 Urinary Incontinence Score (ICI-short form).

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment

Outcome: 4 Urinary Incontinence Score (ICI-short form)

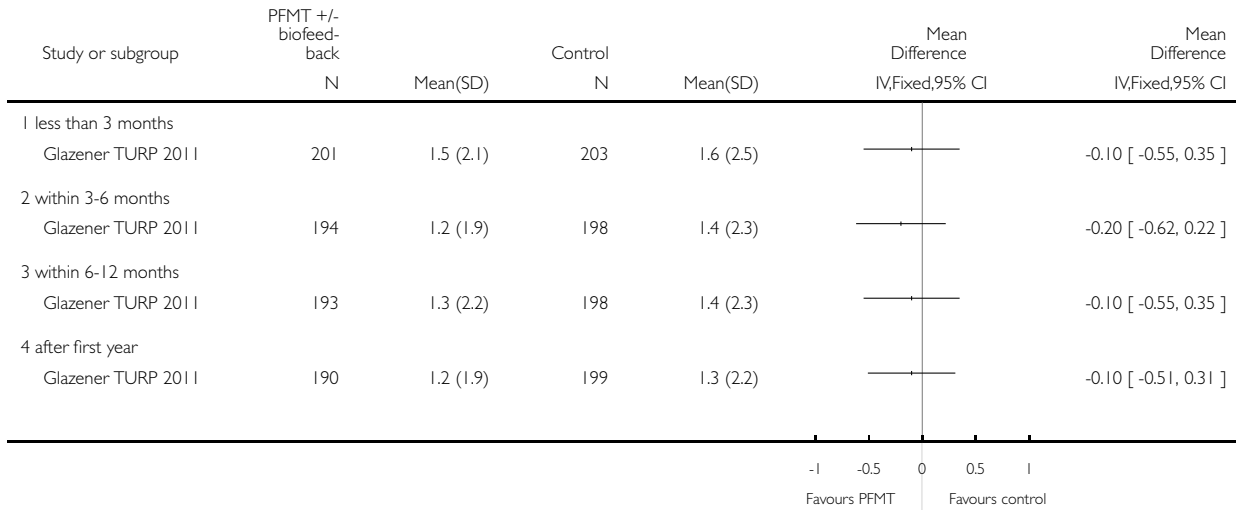


Analysis 11.5. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 5 Quality of life related to urinary incontinence.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 11 Treatment of UI after TURP: PFMT biofeedback versus no treatment

Outcome: 5 Quality of life related to urinary incontinence



Analysis 11.6. Comparison 11 Treatment of UI after TURP: PFMT ± biofeedback versus no treatment, Outcome 6 Number of men not carrying out pelvic floor muscle contractions at 12 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 11 Treatment of UI after TURP: PFMT biofeedback versus no treatment

Outcome: 6 Number of men not carrying out pelvic floor muscle contractions at 12 months

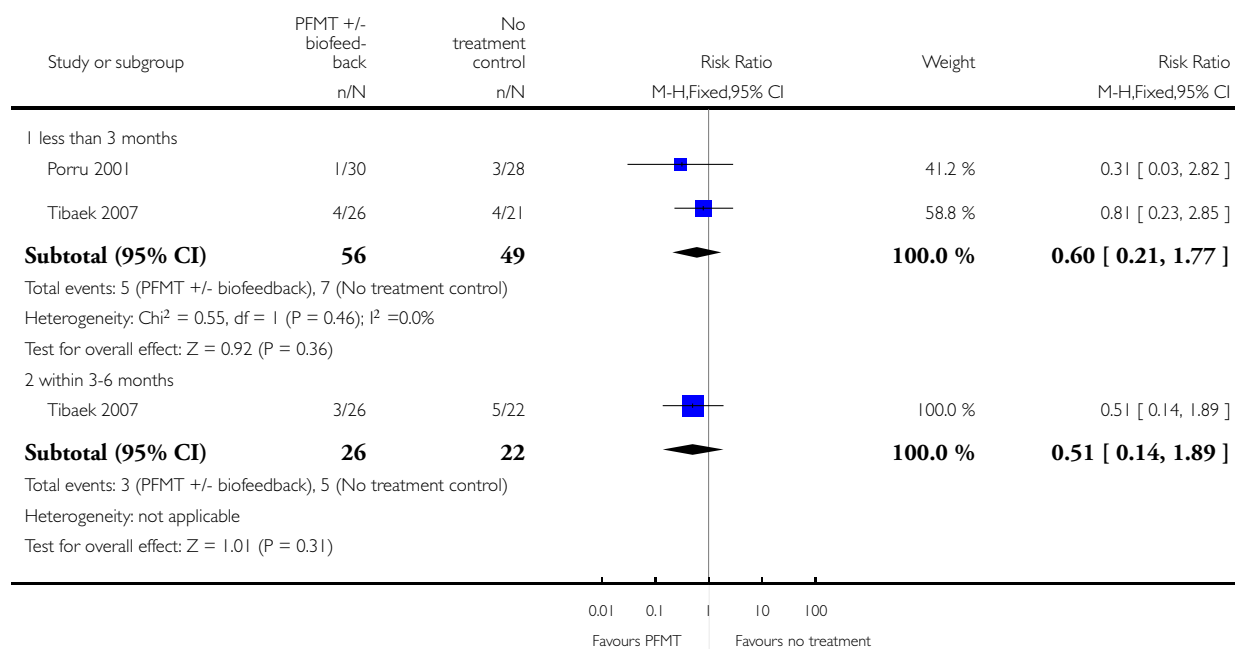


Analysis 16.1. Comparison 16 Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment, Outcome 1 Number of incontinent men.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 16 Prevention of UI after TURP: pre or post-operative PFMT biofeedback versus no treatment

Outcome: 1 Number of incontinent men

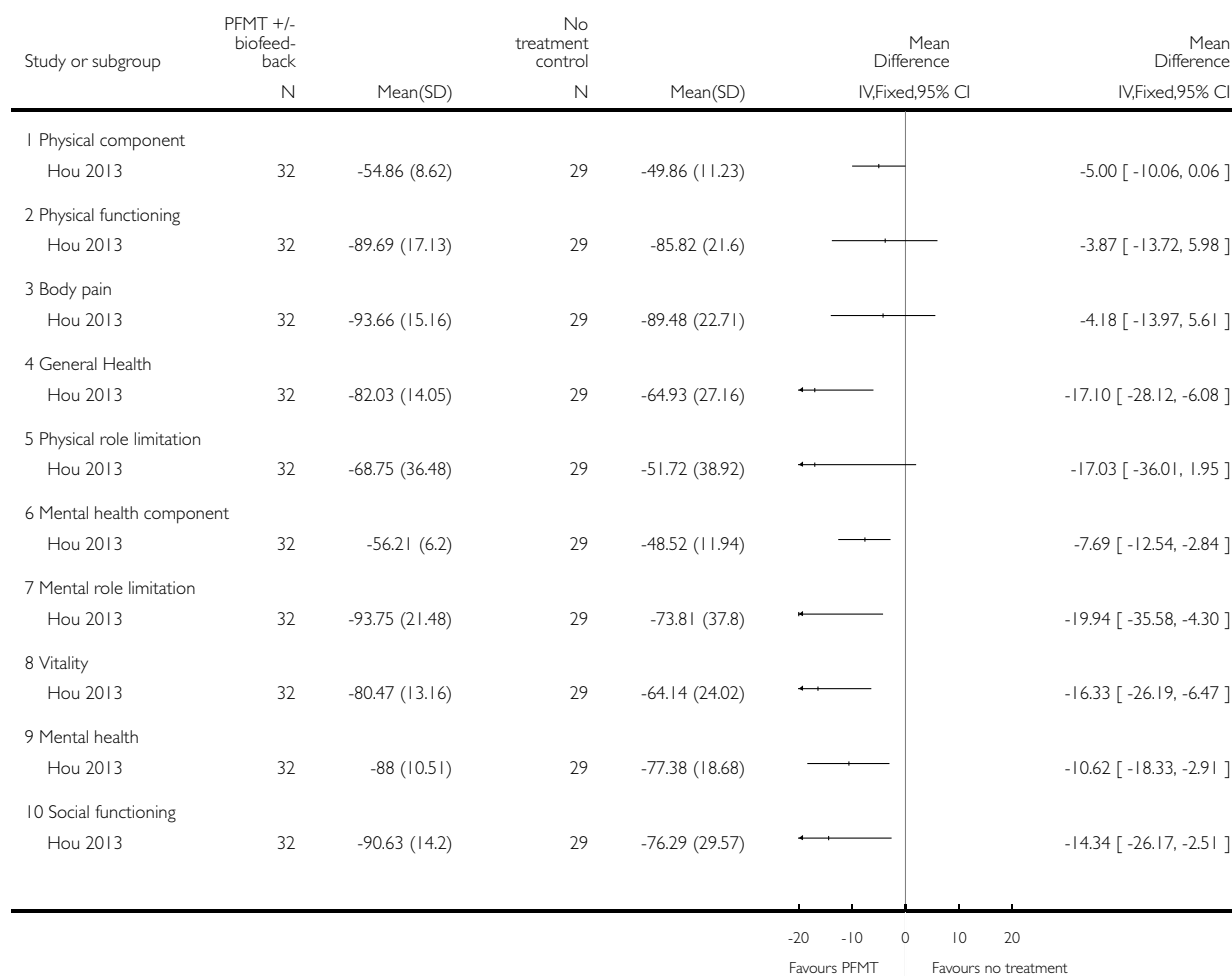


Analysis 16.2. Comparison 16 Prevention of UI after TURP: pre or post-operative PFMT ± biofeedback versus no treatment, Outcome 2 Health status measure SF-36 within 3-6 months.

Review: Conservative management for postprostatectomy urinary incontinence

Comparison: 16 Prevention of UI after TURP: pre or post-operative PFMT biofeedback versus no treatment

Outcome: 2 Health status measure SF-36 within 3-6 months



Analysis 21.I. Comparison 21 Containment of urinary incontinence from any cause: external penile compression devices (penile clamps) versus no treatment, Outcome 1 Number of men satisfied with device.

Number of men satisfied with device

Study	Control (no device)	U-TeX	C3	Cunningham
Moore 2004	0/12	0/12	2/12	10/12

Analysis 21.2. Comparison 21 Containment of urinary incontinence from any cause: external penile compression devices (penile clamps) versus no treatment, Outcome 2 Mean urine loss (grams of urine on pad test).

Mean urine loss (grams of urine on pad test)

Study	Control (no device)	U-TEX	C3	Cunningham
Moore 2004	122.8 gm (SD 130.8)	53.3 gm (SD 65.7) P<0.05 vs Control (no device)	32.3 gm (SD 24.3) P<0.05 vs Control (no device)	17.1 gm (SD 21.3) P<0.05 vs Control (no device)

Analysis 21.3. Comparison 21 Containment of urinary incontinence from any cause: external penile compression devices (penile clamps) versus no treatment, Outcome 3 Penile Doppler blood flow (mean systolic velocity).

Penile Doppler blood flow (mean systolic velocity)

Study	Control (no device)	U-TEX	C3	Cunningham
Moore 2004	N=12 men R: 12.4 (SD 2.8) L: 12.3 (SD 3.0)	N=12 men R: 11.9 (SD 4.4) L: 13.8 (SD 7.3)	N=12 men R: 12.4 (SD 5.5) L: 11.7 (SD 4.7)	N=12 men R: 9.5 (SD 2.3) L: 7.3 (SD 3.0) P<0.05 vs Control (no device)

Analysis 21.4. Comparison 21 Containment of urinary incontinence from any cause: external penile compression devices (penile clamps) versus no treatment, Outcome 4 Penile Doppler blood flow (mean resistance to flow index).

Penile Doppler blood flow (mean resistance to flow index)

Study	Control (no device)	U-TEX	C3	Cunningham
Moore 2004	N=12 men R: 0.9 (SD 0.1) L: 0.87 (SD 0.1)	N=12 men R: 0.93 (SD 0.08) L: 0.91 (SD 0.11)	N=12 men R: 0.92 (SD 0.1) L: 0.92 (SD 0.11)	N=12 men R: 0.92 (SD 0.13) L: 0.86 (SD 0.29)

ADDITIONAL TABLES

Table 1. Details of interventions

Study ID	Intervention	Control
Ahmed 2012	A: At catheter removal received standard care of verbal and written instructions, instructed by physiotherapist to perform 3 sets of 15-20 contractions daily, for a duration of 3-5 seconds with a 6-10 sec	

Table 1. Details of interventions (Continued)

	<p>ond rest period, encouraged to perform exercises before functional activities such as sneezing, coughing, or lifting weight, also in the supine position, sitting, squatting and going up and down stairs</p> <p>B: ES, treatment started one week after catheter removal, patients received 15 minutes of twice weekly electrical stimulation for 12 weeks</p> <p>C: PFMT + BFB + ES: Treatment started one week after catheter removal, patients received twice weekly treatment with 15 minutes of electrical stimulation and 15 minutes of biofeedback for 12 weeks, instructed to perform 3 series of 10 rapid contractions, 3 sustained contractions of 5, 7 or 10 seconds and then 10 contractions during prolonged expiration in the supine position</p> <p>All patients were given a logbook to complete daily regarding self-report of exercises</p>	
Bales 2000	<p>PFMT + biofeedback 45 minute session with nurse trained in biofeedback. Patients were instructed to perform graded PFMT. Contractions of 5-10 seconds, 10-15 repetitions were performed with biofeedback (surface electrodes used to measure muscle strength). Advised to practice the exercises 4 times per day until surgery</p>	<p>No biofeedback training Written and brief verbal instructions from a nurse on how to perform PFMT (isolate muscle that stops urine flow, practice 4 times per day, 10-15 repetitions)</p>
Burgio 2006	<p>PFMT + biofeedback Single session of biofeedback (rectal probe to measure intra-abdominal rectal pressure and external anal sphincter contraction) assisted behavioural training. Feedback and verbal instruction used to teach control of pelvic muscles. Taught to contract sphincter during 2-10 seconds periods separated by 2-10 seconds of relaxation, dependent on ability Written instructions for daily at home practice of 45 PFM exercises daily (3 sessions of 15 exercises each time). Additionally instructed to slow or interrupt voiding once daily. Encouraged to exercise daily preoperatively, then resume when catheter removed post-operatively</p>	<p>Usual care of brief verbal instructions post operatively to interrupt the voiding stream plus any instruction from physician</p>
Centemero 2009	<p>Intervention A: PFMT both pre and post-operatively. A structured PFMT program 30 and 15 days before surgery, previous physiotherapist evaluation to provide the patients with feedback about the</p>	

Table 1. Details of interventions (Continued)

	<p>quality of pelvic floor muscle function, PC teste (endurance and contraction quality), breathing co-ordination, typify muscle contraction as tonic and modify incorrect physical attitudes. This was also repeated after the procedure</p> <p>Intervention B: PFMT post-operatively only</p>	
Dijkstra-Eshuis 2013	<p>30 mins of guided PFMT + biofeedback weekly for 4 weeks before surgery, received written instructions to: carry out two sets of 30 contractions during abdominal breathing, one breath between each contraction; restart PFMT after catheter removal (7-10 days after surgery)</p> <p>All men were seen before surgery by a physiotherapist, who explained relevant anatomy, anal visual inspection and digital palpation, biofeedback registration with rectal probe, All patients received PFMT + biofeedback or electrical stimulation, or both, if still incontinent after 6 weeks</p>	Received written instructions on PFMT after catheter removal (7-10 days after surgery)
Dubbelman 2004	Nine or less sessions of physiotherapy guided pelvic floor exercises after surgery	Exercise instruction through information folder
Filocamo 2005	Formal instruction (3 treatment sessions plus at home exercises) in PFMT using verbal explanation, palpation and visualization of the base of the penis with a mirror, in different positions and prior to sneezing, coughing or lifting	No formal instruction
Floratos 2002	Initiated after catheter removal, 15 treatment sessions (3 times per week for 30 minutes) of PFMT with EMG (surface) biofeedback in clinic	Instruction with verbal feedback and an information pamphlet with instructions to perform PFMT 50-100 times daily at home
Fode 2014	<p>Pre-operative session guided PFMT + instruction on how to use penile vibratory stimulation device. Instructed to stimulate frenulum once daily, 10 seconds of stimulation then 10 second pause, repeated 10 times for 1 week pre-operatively, instructed to restart stimulation after catheter removal for 6 weeks</p> <p>All men were offered a PDE5 inhibitor after 1 month post-operatively and also received telephone contact to ensure compliance with treatment</p>	Preoperative session guided PFMT
Franke 1998	Biofeedback (perineal patch EMG) enhanced PFMT; exercise treatment sessions at 6, 7, 9, 11, and 16 weeks post-operatively	No treatment.

Table 1. Details of interventions (Continued)

<p>Geraerts 2013</p>	<p>Intervention A: PFMT + biofeedback 30 mins of guided PFMT + biofeedback weekly for 3 weeks before surgery. Patients were instructed to carry out 60 contractions a day at home; contract their pelvic floor while coughing, and sitting down or getting up from a chair. Patients were also instructed to restart PFMT on day 4 after surgery while catheter was in situ Intervention B: Instructed to start PFMT on the day after catheter removal (e.g. 2-3 weeks after surgery) All men: Received weekly individual guided exercise programme with digital or EMG biofeedback after surgery. Advice was given on how to contract pelvic floor muscles to prevent leakage during functional activities. When patients carried out the instructed 60 contractions, they were asked to colour in three squares in their diary to assess compliance</p>	
<p>Ghanem 2013</p>	<p>Pre-operative PFMT for 2 weeks + postoperative PFMT programme</p>	<p>Postoperative PFMT programme only</p>
<p>Goode 2009</p>	<p>Intervention A: Behavioural therapy with PFMT for 8 weeks Intervention B: Behavioural therapy with biofeedback and electrical stimulation for 8 weeks Behavioural therapy consisted of pelvic floor muscle exercises and bladder control strategies in both groups</p>	<p>No treatment</p>
<p>Hoffman 2005</p>	<p>Intervention A: perineal EStim plus physiotherapy (PFMT) Intervention B: anal EStim plus physiotherapy (PFMT)</p>	<p>PFMT alone</p>
<p>Hou 2013</p>	<p>Guided PFMT + biofeedback after catheter removal (2 days post-operatively), instructed to: contract pelvic muscles for 5 seconds and relax for 10 seconds. After discharge, patients were instructed to carry out 5 mins of each PFE three times daily. Patients also received motivational telephone interviews once weekly</p>	<p>No description</p>
<p>Joseph 2000</p>	<p>Intervention A: Instruction in PFMT including biofeedback with visual feedback as well as verbal to assist in identifying and discriminating muscles Intervention B: Instruction in PFMT, squeezing of finger during digital rectal examination</p>	

Table 1. Details of interventions (Continued)

Koo 2009	ExMI, treatment sessions were for 20 minutes twice weekly for 8 weeks	PFMT alone
Laurienzo 2013	<p>A (15): Standard treatment with verbal instructions for PFMT</p> <p>B (17): Pre-operative guided PFMT, with 10 physiotherapy sessions: contractions of the pelvic floor muscles for 5 seconds in "dorsal decubitus" position for 10 times, in the same position with the waist elevated (10 times), lying down with legs adducted against a plastic ball performed 10 times and standing and flexing the hips to 60° (10 times)</p> <p>C (17): Pre-operative PFMT + ES during 10 physiotherapy sessions, ES was with an anal probe lasting 15 minutes in total, and men also received guided PFMT and followed the same training regime as above</p> <p>Men did not receive treatment post-operatively</p>	Instructed to start PFMT at home 15 weeks before surgery.
Liu 2008	Extra-corporeal magnetic innervation (ExMI), the frequency of the pulse field was 10Hz for 10 minutes, followed by a 3 minute rest and a second treatment of 50 Hz for 20 minutes. This was done twice a week	PFMT alone, instructions given to carry out 20mins x 3 a day
Manassero 2007	<p>PFMT re-education program, verbal feedback</p> <p>The training program involved active PFE. verbal feedback of the contraction was used to instruct the patients to correctly and selectively contract their pelvic muscles while relaxing the abdominal muscles. the strength of the pelvic floor muscles was measured by digital anal control using a score of 0 to 5 (0 = no contraction, 5 = good contraction against strong resistance)</p> <p>Initially home practice comprised 45 contractions (3 sessions of 15) per day at home, progressively increasing the number until 90 per day. This was taught by two experienced urologists</p>	No treatment.
Marchiori 2010	<p>Guided PFMT + biofeedback during first session, second session involved 10 sets of pelvic floor electrical stimulation lasting 15 mins each, instructed to: carry out three sets of 30 contractions a day at home for the first month after catheter removal (16 days after surgery)</p> <p>All men received oral and written information on pelvic floor anatomy and on PFME, pelvic floor muscle endurance assessed by digital anal control</p>	Received oral and written information on pelvic floor anatomy and on PFME, instructed to: perform 30 contractions a day at home for the first month after catheter removal (16 days after surgery)

Table 1. Details of interventions (Continued)

<p>Mariotti 2009</p>	<p>PFMT plus ES and biofeedback twice a week for 6 weeks ES - a surface electrodes was inserted into the anus and pulsed, the intensity was adequate to induce visual lifting of the levator ani and pubococcygeus muscle, considering the level of comfort to the patient Biofeedback - via surface electrodes both perineal and abdominally</p>	<p>Instructions to conduct PFMT - verbal and written instructions at catheter removal and follow up visits</p>
<p>Martini 2011</p>	<p>PFMT: 5 sessions of guided PFMT for 2-3 weeks pre-operatively and continued post-operatively All men underwent clinical examination of pelvic muscles function using digital perineal testing according to "AIPDA score" and evaluation of voiding symptoms</p>	<p>Postoperative standard care, written instructions for PFMT</p>
<p>Mathewson-Chapman 97</p>	<p>Pre-operatively received further instruction and practice with PME protocol Home exercises and biofeedback (anal probe) (Incare 8900); practiced at home 3 times a week, starting with daily 15 PFMT and increasing by 10 every 4 weeks to a maximum of 35 PFMT</p>	<p>Post-operatively no further interventions until week 5 when pelvic muscle strength was assessed</p>
<p>Moore 1999</p>	<p>Intervention A: PFMT alone Intervention B: PFMT plus rectal ES treated by one physiotherapist 30 minutes twice a week for 12 weeks Both included home exercises 3x/day gradually working up to 30 minutes per session lying, standing, sitting; strength, endurance, speed and control with maximum contractions of 5-10 seconds, 10-20 second relaxation and 12-20 repetitions; sub-maximum contractions at 65-75% of maximum strength with hold 20-30 seconds and equal rest time, 8-10 repetitions; speed was sets of quick repetitive contractions in a 10 second time span; control involved gradual recruitment to maximum contraction in 3 stages with 5 second hold at each stage and a slow release with rest 15-30 seconds</p>	<p>oral and written information about PFMT pre and post- operatively (standard treatment)</p>
<p>Moore 2004</p>	<p>Each participant had 4 periods (each lasted 1 day) Group A: No device Group B: C3 device Group C: U-TEX device Group D: Cunningham clamp</p>	

Table 1. Details of interventions (Continued)

Moore 2008	Maximum 24 weekly, 30-minute treatment protocol (30 min biofeedback-assisted PFMT) and home exercise protocol of 2-3 times a day	Verbal and written information on PFME and weekly telephone contact by a urology nurse
Morihiro 2011	PFMT + sacral surface therapeutic electrical stimulation (ssTES), ssTES 2x a day for 15 minutes each, lasting 1 month after catheter removal (day 5)	PFME only, carried out alone
Nowak 2007	Extra-corporeal magnetic innervation (EXMI) based pelvic floor device	PFMT alone
Opsomer 1994;	PFMT plus biofeedback plus electrical stimulation directed by physiotherapist	PFMT on their own without medical supervision.
Overgard 2008;	Instructions on PFMT and physiotherapy, 45 minutes weekly Patients were instructed to perform 3 sets of contractions daily at home, in either a supine, sitting or standing position. Digital anal palpation to teach correct contractions, as well as oral and written instructions DVD of instructions given to those living too far from hospital	Instructions on PFMT alone.
Parekh 2003	Two treatment sessions preoperatively. Session 1 consisted of PFMT in a hook lying position Session 2 was on an exercise ball. Teaching methods varied and included verbal cues, visualization with an anatomical model, palpation or biofeedback with rectal probe. Post-operatively, PFMT was reviewed and participants were seen every 3 weeks for 3 months by a physiotherapist Home exercise for 6 months or more for those requiring further physical therapy guidance	No formal education on PFMT pre-operatively, telephone or face to face follow-up at least monthly
Park 2012	Patients performed Kegel exercises together with other types of exercises which included resistance training and pelvic flexibility. The intervention started 3 weeks after surgery and lasted 12 weeks Details of the combined exercise regime: Post-operative weeks 1-4 1) Education about postoperative symptoms 2) Performing Kegel exercises, recognizing the parapelvic muscles 3) Pelvic floor flexibility fitness: performing pelvic exercises while sitting on a ball Post-operative weeks 5-8 (ball exercises) 1) Performing pelvic exercises while sitting on a ball	In the control group, only Kegel exercises were performed

Table 1. Details of interventions (Continued)

	<p>2) Performing lower extremity exercises while placing a ball on the wall</p> <p>3) Lifting a heel on the ball while standing face-to-face with the wall</p> <p>4) Lifting up and down on the ball while spreading and bending legs</p> <p>5) Performing flank exercises while having a ball in the hand</p> <p>6) Squeezing the ball with the adductor muscles while lying on a table</p> <p>Post-operative weeks 9-12 (elastic band exercises)</p> <p>1) Lifting the object with an elastic band lateral, anterior, and posterior to the patient's arms</p> <p>2) Lifting the legs and then spreading them while attaching an elastic band to the foot</p>	
Perissinotto 2008	Early pelvic floor rehabilitation program at home twice daily, Kegel exercises	No formal PFMT
Porru 2001	Initial visit before surgery, digital evaluation of pelvic muscle contraction strength. Verbal instruction, feedback and reinforcement on contraction was given to teach selective contraction of anal sphincter and relaxation of abdominal muscles. Verbal and written instruction given for home PFMT. Weekly digital anal reassessment and grading of pelvic muscle contraction by the therapist. Instructed to practice contractions 45 times per day (3 groups of 15 contractions)	Not specified
Ribeiro 2008	PFMT plus BF weekly for 3 months	PFMT oral instructions only
Robinson 2008	<p>Intervention A: Brief verbal instruction in PFMT before operation and offer of one biofeedback session at 2 months after surgery (uptake 33%) plus PFMT for four weeks with biofeedback</p> <p>Intervention B: Brief verbal instruction in PFMT before operation and offer of one biofeedback session at 2 months after surgery (uptake 46%)</p>	
Robinson 2009	<p>Intervention A: routine brief verbal and written PFMT plus one PFMT session and 3 weekly nurse phone calls</p> <p>Intervention B: routine brief verbal and written PFMT plus four BF enhanced PFMT sessions and 4 weekly nurse phone calls</p>	Routine brief verbal and written PFMT.

Table 1. Details of interventions (Continued)

Seleme 2008	Verbal instruction and information on PFMT plus information on life style changes. Additional 15 physiotherapy sessions consisting of intensive PFMT with BF and ES	Verbal instruction and information on PFMT plus information on life style changes
Tiback 2007	One hour individual session with physiotherapist to teach correct contraction for PFMT, three 1 hour group lessons and home training programme	No pre operative physiotherapy. Information about anatomy and physiology and verbal instructions for 2 to 3 days after TURP in the ward
Tienforti 2012	PFMT + biofeedback Patients received guided PFMT + biofeedback + information about the anatomy of pelvic floor muscles the day before surgery and after catheter removal. They were also given oral and written instructions on Kegel exercises to be performed at home which involved three sets of contractions daily for 10 mins, contracting their pelvic floor while lying, sitting and standing. The frequency of contractions was recorded in a training diary and visits at monthly intervals after catheter removal involved assisted biofeedback and motivation for 20 min	No biofeedback training Received standard care, oral and written instructions from urologist on PFMT, Instructed to: start PFMT after catheter removal (e.g. 2-3 weeks after surgery)
Tobia 2008	PFMT	No PFMT
van Kampen 1998	1 session of PFMT in hospital before discharge and then saw the physiotherapist for 1-2 weeks for as long as UI persisted. 90 daily home exercises sitting, standing and lying. 7 men unable to contract PFM or with weak contraction received electrical stimulation by anal probe	No formal PFMT instruction but saw the therapist at 1-2 weeks and received placebo stimulation and information about aetiology of UI
Wille 2003	Intervention A: PFMT alone Intervention B: PFMT + ES; PFMT as above plus instructed by dedicated in ES via surface anal electrode and bio-impulser (biphasic pulse with 1 second bursts, 5 second pulse width, 2 second pulse trains Intervention C: PFMT + ES + biofeedback. As above plus biofeedback (anal probe) 15 minutes twice daily for 3 months All groups: PFMT by physiotherapist, 20-30 minute sessions for 3 days, instructed to perform exercises twice daily for 3 months plus 3 week rehabilitation program after discharge Regular interaction with health professional for 6 weeks after surgery, encouraged to performed treatment for 3 months post-surgery	

Table 1. Details of interventions (Continued)

Yamanishi 2006	Oral PFMT plus ES for 15 minutes twice daily Instructed pre-operatively PFMT by nurses and continued after catheter removal	Oral PFMT plus sham device. Instructed pre-operatively PFMT by nurses and continued after catheter removal
Yokoyama 2004	Intervention A: anal electrode for 15 minutes twice a day for 1 month Intervention B: extra-corporeal magnetic innervation, neocontrol system, treatment sessions 20 minutes, twice a week for 2 weeks	PFMT, digital anal teaching of correct contractions, then verbal and written instructions for home practice
Zhang 2007	PFMT plus BF using rectal electrical sensor, initial 45 minute session with physical therapist then written instructions to carry out at home three times a day for 10 minutes. Plus support group, 6 meetings in 3 months with a health psychologist	PFMT plus BF using rectal electrical sensor, initial 45 minute session with physical therapist then written instructions to carry out at home three times a day for 10 minutes

APPENDICES

Appendix I. Searches performed for the previous versions of this review up to and including Hunter 2007

Details of the searches performed for previous versions of this review, up to and including 2007 ([Hunter 2007](#)) are given below.

Systematic searches of electronic bibliographic databases

MEDLINE (January 1966 to January 2006), EMBASE (January 1988 to January 2006), CINAHL (January 1982 to January 2006), PsycLIT (January 1984 to January 2006), ERIC (January 1984 to January 2006)

The following electronic bibliographic databases were searched (date search was performed: 10 January 2006):

MEDLINE - dates searched: January 1966 to January 2006;

EMBASE - dates searched: January 1988 to January 2006;

PsycLIT - dates searched: January 1984 to January 2006;

CINAHL - dates searched: January 1982 to January 2006;

ERIC - dates searched: January 1984 to January 2006.

The following search terms were used in each database (no limits were applied to the searches):

incontinence, urinary, male, postprostatectomy, stimulation, electrical stimulation, biofeedback, pelvic muscle exercises, Kegel exercises, behavioural, behaviour, behavior, therapy, behaviour modification, therapy, physiotherapy, lifestyle, weight loss, caffeine, smoking, extracorporeal magnetic innervation, external penile compression devices, continence, bladder control, quality of life, randomised (randomized) controlled trial, evaluation, effectiveness, efficacy, outcomes.

Handsearching of conference proceedings

The following conference proceedings were handsearched:

- American Urological Association (years searched: 1989-2005) Supplement to the Journal of Urology, published as a supplement.
- Society of Urologic Nurses and Associates (SUNA) (formerly American Urologic Association Allied) these abstracts are not published but are available in the SUNA office. Annual meeting (years searched: 1991 to 2003); 1991-Las Vegas, NV; 1992-

Washington, DC; 1993-San Antonio, TX; 1994-San Francisco, CA; 1995-Las Vegas, NV; 1996-Orlando, FL, 1997-New Orleans, LA. Biannual incontinence meeting: 1992-Tampa, Fla (1st meeting), 1994-Phoenix, 1996-Dallas, 1998-Orlando, 2000-Nashville, 2004-Chicago, 2006-NYC; Understanding urodynamics seminar: 1993-Denver, CO; 1994-San Antonio, TX; 1995-Cleveland, OH; 1996-St Louis, MO.

- Wound Ostomy and Continence Nurses (years searched: 1996, 1997, 1999 to 2006). Annual meeting: 1996- Seattle, WA; 1997-Nashville, TN; Incontinence meeting (biannual); 1997-Beverly Hills (1st meeting); 1999-Austin, TX. (No further Incontinence meetings.)
- International Continence Society (years searched: 1980 to 2006). Published proceedings in Neurourology and Urodynamics.

Appendix 2. Searches performed for the previous version of this review (Campbell 2012)

Extra specific searches (additional to the Specialised Register search) were performed for previous version of the review (Campbell 2012). These are detailed below:

- CINAHL on EBSCO (January 1982 to 20 November 2009) was searched on 7 December 2009;
- EMBASE on Ovid (January 1980 to Week 48 2009) was searched on 3 December 2009.

The search strategies used to search these databases can be found below:

CINAHL on EBSCO (January 1982 to 20 November 2009) was searched on 7 December 2009:

S38	S31 and S35 and S37
S37	S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21 or S36
S36	TI (singl* N25 blind* OR singl* N25 mask* OR doubl* N25 blind* or doubl* N25 mask* OR trebl* N25 blind* OR trebl* N25 mask* OR tripl* N25 blind* OR tripl* N25 mask*) or AB (singl* N25 blind* OR singl* N25 mask* OR doubl* N25 blind* or doubl* N25 mask* OR trebl* N25 blind* OR trebl* N25 mask* OR tripl* N25 blind* OR tripl* N25 mask*)
S35	(S32 or S33 or S34)
S34	TI postprostat* OR AB postprostat*
S33	TI post-prostat* OR AB post-prostat*
S32	(MH "Prostatectomy")
S31	(S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30)
S30	AB overactive N3 bladder*
S29	TI overactive N3 bladder*
S28	AB urin* N3 leak*
S27	TI urin* N3 leak*
S26	AB incontinen* OR continen*
S25	TI incontinen* OR continen*

(Continued)

S24	(MH "Incontinence")
S23	(MH "Overactive Bladder")
S22	(MH "Urinary Incontinence+")
S21	(MH "Comparative Studies")
S20	(MH "Clinical Research+")
S19	(MH "Static Group Comparison")
S18	(MH "Quantitative Studies")
S17	(MH "Crossover Design") or (MH "Solomon Four-Group Design")
S16	(MH "Factorial Design")
S15	(MH "Community Trials")
S14	(MH "Random Sample")
S13	TI balance* N2 block* or AB balance* N2 block*
S12	TI "latin square" or AB "latin square"
S11	TI factorial or AB factorial
S10	TI clin* N25 trial* or AB clin* N25 trial*
S9	(MH "Study Design")
S8	(AB random*) OR (TI random*)
S7	(AB placebo*) OR (TI placebo*)
S6	(MH "Placebos")
S5	PT Clinical Trial
S4	(MH "Clinical Trials+")
S3	MH (random assignment) OR (crossover design)
S2	cross-over
S1	crossover

EMBASE on Ovid (January 1980 to Week 48 2009) was searched on 5 December 2009:

1	Randomized Controlled Trial/
2	controlled study/
3	clinical study/
4	major clinical study/
5	prospective study/
6	meta analysis/
7	exp clinical trial/
8	randomization/
9	crossover procedure/ or double blind procedure/ or parallel design/ or single blind procedure/
10	Placebo/
11	latin square design/
12	exp comparative study/
13	follow up/
14	pilot study/
15	family study/ or feasibility study/ or pilot study/ or study/
16	placebo\$.tw.
17	random\$.tw.
18	(clin\$ adj25 trial\$).tw.
19	((singl\$ or doubl\$ or trebl\$ or tripl\$) adj25 (blind\$ or mask\$)).tw
20	factorial.tw.
21	crossover.tw.
22	latin square.tw.
23	(balance\$ adj2 block\$).tw.
24	factorial design/

(Continued)

25	parallel design/
26	triple blind procedure/
27	community trial/
28	intervention study/
29	experimental study/
30	prevention study/
31	quasi experimental study/
32	or/1-31
33	(nonhuman not human).sh.
34	32 not 33
35	exp urine incontinence/
36	incontinence/
37	overactive bladder/
38	(incontinen\$ or continen\$).tw.
39	(urin\$ adj2 leak\$).tw.
40	(overactive adj2 bladder\$).tw.
41	35 or 36 or 37 or 38 or 39 or 40
42	prostatectomy/
43	post-prostat\$.tw.
44	postprostat\$.tw.
45	42 or 43 or 44
46	electrostimulation/ or electrostimulation therapy/
47	stimulation.mp.
48	(electric\$ adj2 stimulat\$).tw.

(Continued)

49	electrostimulat\$.tw.
50	magnetotherapy/
51	exmi.tw.
52	(magnet\$ adj2 (stimulat\$ or innervat\$)).tw.
53	feedback system/
54	biofeedback.tw.
55	pelvis floor/ or muscle training/ or pelvic floor muscle training/ or muscle exercise/ or muscle strength/
56	(pelvi\$ adj5 (exercis\$ or train\$)).tw.
57	pfmt.tw.
58	pfe.tw.
59	(kegel adj2 exercis\$).tw.
60	behavior therapy/
61	(behavio?r\$ adj3 (therap\$ or train\$ or treat\$)).tw.
62	physiotherapy/
63	home physiotherapy/ or physiotherapy practice/
64	physiotherapist/ or physiotherapist assistant/
65	physiotherap\$.tw.
66	(physi\$ adj3 (therap\$ or treat\$)).tw.
67	lifestyle/ or lifestyle modification/
68	(lifestyle\$ adj3 (chang\$ or modif\$)).tw.
69	(life adj2 style\$ adj3 (chang\$ or modif\$)).tw.
70	weight reduction/
71	(weight adj3 (los\$ or reduc\$)).tw.
72	caffeine/

(Continued)

73	caffeine.tw.
74	smoking cessation/
75	smoking cessation.tw.
76	(peni\$ adj3 (device\$ or clamp\$)).tw.
77	“quality of life”/
78	quality of life.tw.
79	or/46-78
80	34 and 41 and 45 and 79

Appendix 3. Searches performed for the current version of this review

Specific searches were also performed for this update of the review. These are detailed below:

- CENTRAL (on OvidSP) (2014, Issue 1) was searched on 26 February 2014;
- Embase (on OvidSP) (January 1980 to Week 3 2014) was searched on 20 January 2014;
- CINAHL (on EBSCOhost) (January 1982 to 18 January 2014) was searched on 22 January 2014;
- ClinicalTrials.gov (via the Cochrane Register of Studies (CRS) interface) and WHO ICTRP (both searched on 29 January 2014)

The search strategies used to search these databases can be found below:

CENTRAL (on OvidSP) (2014, Issue 1) was searched on 26 February 2014

1. exp urinary incontinence/
2. (incontinen\$ or continen\$).tw.
3. (urin\$ adj2 leak\$).tw.
4. or/1-3
5. prostate/
6. prostatectomy/
7. prostatic hyperplasia/
8. prostatic neoplasms/
9. prostatitis/
10. prostatic diseases/
11. prostat\$.tw.
12. post-prostat\$.tw.
13. postprostat\$.tw.
14. or/5-13
15. 4 and 14
16. cochrane incontinence group.gc.
17. 15 not 16

EMBASE (on OvidSP) (January 1947 to Week 3 2014) was searched on 20 January 2014 and limited to entry month January 2010 to Week 3 2014 (using 201\$.em.) as the Cochrane Collaboration searches EMBASE centrally and is currently bringing this search up to date.

1	Randomized Controlled Trial/
2	controlled study/
3	clinical study/
4	major clinical study/
5	prospective study/
6	meta analysis/
7	exp clinical trial/
8	randomization/
9	crossover procedure/ or double blind procedure/ or parallel design/ or single blind procedure/
10	Placebo/
11	latin square design/
12	exp comparative study/
13	follow up/
14	pilot study/
15	family study/ or feasibility study/ or pilot study/ or study/
16	placebo\$.tw.
17	random\$.tw.
18	(clin\$ adj25 trial\$).tw.
19	((singl\$ or doubl\$ or trebl\$ or tripl\$) adj25 (blind\$ or mask\$)).tw
20	factorial.tw.
21	crossover.tw.
22	latin square.tw.
23	(balance\$ adj2 block\$).tw.
24	factorial design/

(Continued)

25	parallel design/
26	triple blind procedure/
27	community trial/
28	intervention study/
29	experimental study/
30	prevention study/
31	quasi experimental study/
32	or/1-31
33	(nonhuman not human).sh.
34	32 not 33
35	exp urine incontinence/
36	incontinence/
37	overactive bladder/
38	(incontinen\$ or continen\$).tw.
39	(urin\$ adj2 leak\$).tw.
40	(overactive adj2 bladder\$).tw.
41	35 or 36 or 37 or 38 or 39 or 40
42	prostatectomy/
43	post-prostat\$.tw.
44	postprostat\$.tw.
45	42 or 43 or 44
46	electrostimulation/ or electrostimulation therapy/
47	stimulation.mp.
48	(electric\$ adj2 stimulat\$).tw.

(Continued)

49	electrostimulat\$.tw.
50	magnetotherapy/
51	exmi.tw.
52	(magnet\$ adj2 (stimulat\$ or innervat\$)).tw.
53	feedback system/
54	biofeedback.tw.
55	pelvis floor/ or muscle training/ or pelvic floor muscle training/ or muscle exercise/ or muscle strength/
56	(pelvi\$ adj5 (exercis\$ or train\$)).tw.
57	pfmt.tw.
58	pfe.tw.
59	(kegel adj2 exercis\$).tw.
60	behavior therapy/
61	(behavio?r\$ adj3 (therap\$ or train\$ or treat\$)).tw.
62	physiotherapy/
63	home physiotherapy/ or physiotherapy practice/
64	physiotherapist/ or physiotherapist assistant/
65	physiotherap\$.tw.
66	(physi\$ adj3 (therap\$ or treat\$)).tw.
67	lifestyle/ or lifestyle modification/
68	(lifestyle\$ adj3 (chang\$ or modif\$)).tw.
69	(life adj2 style\$ adj3 (chang\$ or modif\$)).tw.
70	weight reduction/
71	(weight adj3 (los\$ or reduc\$)).tw.
72	caffeine/

(Continued)

73	caffeine.tw.
74	smoking cessation/
75	smoking cessation.tw.
76	(peni\$ adj3 (device\$ or clamp\$)).tw.
77	“quality of life”/
78	quality of life.tw.
79	or/46-78
80	34 and 41 and 45 and 79

CINAHL (on EBSCOhost) (January 1982 to 18 January 2014) was searched on 22 January 2014

S38	S31 and S35 and S37
S37	S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21 or S36
S36	TI (singl* N25 blind* OR singl* N25 mask* OR doubl* N25 blind* or doubl* N25 mask* OR trebl* N25 blind* OR trebl* N25 mask*OR tripl* N25 blind* OR tripl* N25 mask*) or AB (singl* N25 blind* OR singl* N25 mask* OR doubl* N25 blind* or doubl* N25 mask* OR trebl* N25 blind* OR trebl* N25 mask*OR tripl* N25 blind* OR tripl* N25 mask*)
S35	(S32 or S33 or S34)
S34	TI postprostat* OR AB postprostat*
S33	TI post-prostat* OR AB post-prostat*
S32	(MH “Prostatectomy”)
S31	(S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30)
S30	AB overactive N3 bladder*
S29	TI overactive N3 bladder*
S28	AB urin* N3 leak*
S27	TI urin* N3 leak*
S26	AB incontinen* OR continen*

(Continued)

S25	TI incontinen* OR continen*
S24	(MH "Incontinence")
S23	(MH "Overactive Bladder")
S22	(MH "Urinary Incontinence+")
S21	(MH "Comparative Studies")
S20	(MH "Clinical Research+")
S19	(MH "Static Group Comparison")
S18	(MH "Quantitative Studies")
S17	(MH "Crossover Design") or (MH "Solomon Four-Group Design")
S16	(MH "Factorial Design")
S15	(MH "Community Trials")
S14	(MH "Random Sample")
S13	TI balance* N2 block* or AB balance* N2 block*
S12	TI "latin square" or AB "latin square"
S11	TI factorial or AB factorial
S10	TI clin* N25 trial* or AB clin* N25 trial*
S9	(MH "Study Design")
S8	(AB random*) OR (TI random*)
S7	(AB placebo*) OR (TI placebo*)
S6	(MH "Placebos")
S5	(PT Clinical Trial) OR (PT "randomized controlled trial")
S4	(MH "Clinical Trials+")
S3	MH (random assignment) OR (crossover design)
S2	cross-over

(Continued)

S1	crossover
----	-----------

ClinicalTrials.gov (via the Cochrane Register of Studies (CRS) interface) (searched on 29 January 2014)
(Continent OR continence OR incontinent OR incontinence OR overactive OR overactivity) AND (prostate OR prostatectomy OR postprostatectomy OR prostatic OR prostatectomies OR prostatic OR prostatectomies OR postprostatectomies)

WHO ICTRP (searched on 29 January 2014)

Simple search with each of these lines searched and assessed separately:

Incontinent AND postprostatectomy

Incontinence AND postprostatectomy

Incontinent AND prostatectomy

Incontinence AND prostatectomy

WHAT'S NEW

Last assessed as up-to-date: 5 February 2014.

Date	Event	Description
26 January 2015	Amended	Incorporated following sentence in the abstract "It seems unlikely that men benefit from one-to-one PFMT therapy after TURP."

HISTORY

Protocol first published: Issue 3, 1998

Review first published: Issue 4, 1999

Date	Event	Description
19 January 2015	New citation required but conclusions have not changed	In this update, the review authors have added 13 new trials (Ahmed 2012 ; Dijkstra-Eshuis 2013 ; Fader 2013 ; Fode 2014 ; Geraerts 2013 ; Ghanem 2013 ; Hou 2013 ; Laurienzo 2013 ; Marchiori 2010 ; Martini 2011 ; Morihiro 2011 ; Park 2012 ; Tienforti 2012). Risk of bias assessment was performed on all 50 trials in accordance with the current methodology. Overall, 37/50 trials were also included in the previous update (Campbell 2012) and 13/50 trials were identified in this update. Quality of evidence was assessed by adopting the GRADE approach

(Continued)

19 January 2015	New search has been performed	In this update, the review authors have added 13 new trials (Ahmed 2012; Dijkstra-Eshuis 2013; Fader 2013; Fode 2014; Geraerts 2013; Ghanem 2013; Hou 2013; Laurienzo 2013; Marchiori 2010; Martini 2011; Morihito 2011; Park 2012; Tienforti 2012). Risk of bias assessment was performed on all 50 trials in accordance with the current methodology. Overall, 37/50 trials were also included in the previous update (Campbell 2012) and 13/50 trials were identified in this update. Quality of evidence was assessed by adopting the GRADE approach
24 August 2011	New search has been performed	18 new trials added
24 August 2011	New citation required and conclusions have changed	In this update, 18 new trials have been added (of which 1 was a previously excluded trial). The total number of trials included is now 37
16 September 2008	Amended	Converted to new review format.
21 February 2007	New citation required and conclusions have changed	Substantive amendment. In this update (Issue 2 2007), 7 trials were added to the review. The total number of studies included was 17. In this update, comparisons were separated on the basis of type of surgery and as well whether the intervention occurred pre- or post-operatively
25 February 2004	New citation required and conclusions have changed	Substantive update Issue 2 2004. In this update, five trials were added to the review. One trial previously listed as included was excluded after attempts to contact the author to access data were unsuccessful. The total number of studies included was 10. 7 extra studies were excluded
23 January 2001	New citation required and conclusions have changed	Substantive update Issue 2 2001

CONTRIBUTIONS OF AUTHORS

For the updates in 2004 and 2006, the original lead review author (KNM) and an additional review author (KFH) independently undertook the quality assessment, data extraction and collation. KFH took the lead in updating the text and completed the data entry, which were then checked and commented upon by the other review authors.

For the earlier versions, two of the original review authors undertook the quality assessment of the trials and the data extraction independently. This information was then collated and checked by the original lead review author (KNM) for agreement and, in the few instances where this did not occur, consensus was reached after checking with the other review authors. For the 2004 and 2006 updates, KFH updated the text and entered the data. These were checked by the other review authors, whose additional comments and edits were then incorporated.

For the update in 2012, CG and SC undertook quality assessment and data abstraction for the 18 new included trials, revised the previous data as appropriate, analysed the data and wrote the review text assisted by JC. All review authors contributed to writing or editing the text of the review.

For this update in 2014, CA, MO and CG undertook abstract and full text screening. CA and CG performed data abstraction, cross-checked by MO. CA, MO and CG performed risk of bias assessment of trials. Quality of evidence was assessed by CA and MO. Previous data were updated, if necessary, and previously included trials were re-assessed with the additional risk of bias domains. CA took the lead in drafting the manuscript of the review. All review authors contributed to the analysis of data and made comments and suggestions on the manuscript, which were incorporated in the review.

DECLARATIONS OF INTEREST

Coral A Anderson: none known

Muhammad Imran Omar: none known

Susan E Campbell: none known

Kathleen F Hunter has been a speaker at the Jewish General Hospital (Montreal, Canada) and is currently a local co-investigator on a multi-national drug trial funded by Astelles

June D Cody: none known

Cathryn MA Glazener was the Chief Investigator on one of the included trials, MAPS ([Glazener RP 2011](#); [Glazener TURP 2011](#))

SOURCES OF SUPPORT

Internal sources

- University of Alberta, Edmonton, Alberta, Canada.

External sources

- National Institute for Health Research (NIHR), UK.

The National Institute for Health Research (NIHR) is the largest single funder of the Cochrane Incontinence Group.

- Chief Scientist Office, Scottish Executive Health Department, UK.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

Trials were reclassified as 'treatment' or 'prevention' trials in a previous version of this review, and hence trials amongst men having radical prostatectomy or TURP were analysed separately. The trials of containment (penile clamps) were analysed separately from those of PFMT and its variations.

In the current update, the GRADE method was used to assess quality of evidence.

INDEX TERMS

Medical Subject Headings (MeSH)

Biofeedback, Psychology; Electric Stimulation Therapy [methods]; Erectile Dysfunction [rehabilitation]; Exercise Therapy [methods]; Magnetic Field Therapy [methods]; Pelvic Floor; Prostatectomy [*adverse effects]; Randomized Controlled Trials as Topic; Urinary Incontinence [etiology; *therapy]

MeSH check words

Humans; Male