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# Conservative interventions for managing urinary incontinence after prostate surgery (Review)

Johnson EE, Mamoulakis C, Stoniute A, Omar MI, Sinha S

Johnson EE, Mamoulakis C, Stoniute A, Omar MI, Sinha S.
Conservative interventions for managing urinary incontinence after prostate surgery.
*Cochrane Database of Systematic Reviews* 2023, Issue 4. Art. No.: CD014799.
DOI: 10.1002/14651858.CD014799.pub2.

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[Intervention Review]

# Conservative interventions for managing urinary incontinence after prostate surgery

Eugenie E Johnson[1,2], Charalampos Mamoulakis[3], Akvile Stoniute[1,2], Muhammad Imran Omar[4,5], Sanjay Sinha[6]

[1]Population Health Sciences Institute, Newcastle University, Newcastle upon Tyne, UK. [2]NIHR Innovation Observatory, Newcastle University, Newcastle upon Tyne, UK. [3]Department of Urology, University General Hospital of Heraklion, University of Crete Medical School, Heraklion, Crete, Greece. [4]Guidelines Office, European Association of Urology, Arnhem, Netherlands. [5]Academic Urology Unit, University of Aberdeen, Aberdeen, UK. [6]Department of Urology, Apollo Hospital, Hyderabad, India

**Contact:** Eugenie E Johnson, eugenie.johnson@newcastle.ac.uk.

**Editorial group:** Cochrane Incontinence Group.
**Publication status and date:** New, published in Issue 4, 2023.

**Citation:** Johnson EE, Mamoulakis C, Stoniute A, Omar MI, Sinha S. Conservative interventions for managing urinary incontinence after prostate surgery. *Cochrane Database of Systematic Reviews* 2023, Issue 4. Art. No.: CD014799. DOI: 10.1002/14651858.CD014799.pub2.



## ABSTRACT

### Background

Men may need to undergo prostate surgery to treat prostate cancer or benign prostatic hyperplasia. After these surgeries, men may experience urinary incontinence (UI). Conservative treatments such as pelvic floor muscle training (PFMT), electrical stimulation and lifestyle changes can be undertaken to help manage the symptoms of UI.

### Objectives

To assess the effects of conservative interventions for managing urinary incontinence after prostate surgery.

### Search methods

We searched the Cochrane Incontinence Specialised Register, which contains trials identified from the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, MEDLINE In-Process, MEDLINE Epub Ahead of Print, ClinicalTrials.gov, WHO ICTRP and handsearched journals and conference proceedings (searched 22 April 2022). We also searched the reference lists of relevant articles.

### Selection criteria

We included randomised controlled trials (RCTs) and quasi-RCTs of adult men (aged 18 or over) with UI following prostate surgery for treating prostate cancer or LUTS/BPO. We excluded cross-over and cluster-RCTs. We investigated the following key comparisons: PFMT plus biofeedback versus no treatment; sham treatment or verbal/written instructions; combinations of conservative treatments versus no treatment, sham treatment or verbal/written instructions; and electrical or magnetic stimulation versus no treatment, sham treatment or verbal/written instructions.

### Data collection and analysis

We extracted data using a pre-piloted form and assessed risk of bias using the Cochrane risk of bias tool. We used the GRADE approach to assess the certainty of outcomes and comparisons included in the summary of findings tables. We used an adapted version of GRADE to assess certainty in results where there was no single effect measurement available.

### Main results

We identified 25 studies including a total of 3079 participants. Twenty-three studies assessed men who had previously undergone radical prostatectomy or radical retropubic prostatectomy, while only one study assessed men who had undergone transurethral resection of the

prostate. One study did not report on previous surgery. Most studies were at high risk of bias for at least one domain. The certainty of evidence assessed using GRADE was mixed.

**PFMT plus biofeedback versus no treatment, sham treatment or verbal/written instructions**

Four studies reported on this comparison. PFMT plus biofeedback may result in greater subjective cure of incontinence from 6 to 12 months (1 study; n = 102; low-certainty evidence). However, men undertaking PFMT and biofeedback may be less likely to be objectively cured at from 6 to 12 months (2 studies; n = 269; low-certainty evidence). It is uncertain whether undertaking PFMT and biofeedback has an effect on surface or skin-related adverse events (1 study; n = 205; very low-certainty evidence) or muscle-related adverse events (1 study; n = 205; very low-certainty evidence). Condition-specific quality of life, participant adherence to the intervention and general quality of life were not reported by any study for this comparison.

**Combinations of conservative treatments versus no treatment, sham treatment or verbal/written instructions**

Eleven studies assessed this comparison. Combinations of conservative treatments may lead to little difference in the number of men being subjectively cured or improved of incontinence between 6 and 12 months (RR 0.97, 95% CI 0.79 to 1.19; 2 studies; n = 788; low-certainty evidence; in absolute terms: no treatment or sham arm: 307 per 1000 and intervention arm: 297 per 1000). Combinations of conservative treatments probably lead to little difference in condition-specific quality of life (MD -0.28, 95% CI -0.86 to 0.29; 2 studies; n = 788; moderate-certainty evidence) and probably little difference in general quality of life between 6 and 12 months (MD -0.01, 95% CI -0.04 to 0.02; 2 studies; n = 742; moderate-certainty evidence). There is little difference between combinations of conservative treatments and control in terms of objective cure or improvement of incontinence between 6 and 12 months (MD 0.18, 95% CI -0.24 to 0.60; 2 studies; n = 565; high-certainty evidence). However, it is uncertain whether participant adherence to the intervention between 6 and 12 months is increased for those undertaking combinations of conservative treatments (RR 2.08, 95% CI 0.78 to 5.56; 2 studies; n = 763; very low-certainty evidence; in absolute terms: no intervention or sham arm: 172 per 1000 and intervention arm: 358 per 1000). There is probably no difference between combinations and control in terms of the number of men experiencing surface or skin-related adverse events (2 studies; n = 853; moderate-certainty evidence), but it is uncertain whether combinations of treatments lead to more men experiencing muscle-related adverse events (RR 2.92, 95% CI 0.31 to 27.41; 2 studies; n = 136; very low-certainty evidence; in absolute terms: 0 per 1000 for both arms).

**Electrical or magnetic stimulation versus no treatment, sham treatment or verbal/written instructions**

We did not identify any studies for this comparison that reported on our key outcomes of interest.

**Authors' conclusions**

Despite a total of 25 trials, the value of conservative interventions for urinary incontinence following prostate surgery alone, or in combination, remains uncertain. Existing trials are typically small with methodological flaws. These issues are compounded by a lack of standardisation of the PFMT technique and marked variations in protocol concerning combinations of conservative treatments. Adverse events following conservative treatment are often poorly documented and incompletely described. Hence, there is a need for large, high-quality, adequately powered, randomised control trials with robust methodology to address this subject.

## PLAIN LANGUAGE SUMMARY

**Conservative interventions for managing urinary incontinence after prostate surgery**

**Key messages**

- In men who have urinary incontinence following prostate surgery, combined non-pharmacological and non-surgical treatments may make little difference to continence, quality of life or the number of men experiencing adverse events as a result of the interventions.

- The evidence is uncertain as to whether pelvic floor muscle training combined with biofeedback has any effect on incontinence or quality of life, while no evidence was identified assessing electrical stimulation for our key outcomes of interest.

- The uncertainty in the evidence we found means that further research is needed.

**Background**

The prostate is a small, walnut-sized gland that helps men produce semen. If men develop prostate cancer or experience non-cancerous enlargement of the prostate that blocks the bladder outlet (known as benign prostatic obstruction), they may require surgery. After prostate surgery, men can experience urinary incontinence; it has been estimated that between 2% and 60% of men may experience symptoms. While urinary incontinence can improve naturally after surgery, some men continue to have symptoms that can impact on their quality of life.

**What did we want to find out?**

Where possible, urinary incontinence following prostate surgery can be managed using non-surgical and non-pharmacological interventions such as pelvic floor muscle training (PFMT), electrical or magnetic stimulation, lifestyle modifications (such as diet or water

intake), as well as combinations of these. However, there is currently uncertainty surrounding the benefits of these treatments. Therefore, we wanted to find out whether undertaking non-surgical and non-pharmacological interventions helps manage urinary incontinence in men who have undergone prostate surgery.

**What did we do?**

We searched for studies investigating the effects of non-surgical and non-pharmacological treatments on urinary incontinence in men who have undergone prostate surgery. We compared and summarised the results of these studies and rated the confidence we had in our findings based on the studies' methods, size and results.

**What did we find?**

We found 25 studies including a total of 3079 men. Twenty-three of these recruited men who had previously undergone a form of radical prostate surgery, where the entire prostate is removed. Only one study recruited men who had previously undergone transurethral resection of the prostate, a procedure where parts of the prostate are removed through the penis. We were unclear on what type of surgery men in one study had undergone.

Four studies stated that they did not receive any funding, while seven were funded solely by governmental organisations and one solely by a foundation. One study was funded by a governmental organisation and a university, one by a charity and a university and one through both charity and a pharmaceutical company. Ten studies did not report where they had obtained funding for their study.

**Main results**

Four studies reported on PFMT plus biofeedback versus no treatment, sham treatment and/or verbal or written instructions to perform the intervention. PFMT plus biofeedback may result in more men reporting cure of incontinence from 6 to 12 months. However, men undertaking PFMT and biofeedback may be less likely to be cured according to clinicians' measures at from 6 to 12 months. It is uncertain whether undertaking PFMT and biofeedback has an effect on surface- or skin-related adverse events (e.g. skin reactions or bruising) or muscle-related side-effects (e.g. soreness or discomfort). Condition-specific quality of life, participant adherence to the intervention and general quality of life were not reported by any study for this comparison.

Eleven studies assessed combinations of conservative treatments versus no treatment, sham treatment and/or verbal or written instructions to perform the intervention. Combinations of treatments may lead to little difference in the number of men reporting cure or improvement of incontinence between 6 and 12 months. Combinations of treatments probably lead to little difference in condition-specific quality of life and probably little difference in general quality of life between 6 and 12 months. There is little difference between combinations of treatments and control in terms of cure or improvement of incontinence using clinicians' measures between 6 and 12 months. However, it is uncertain whether participant adherence to the intervention between 6 and 12 months is increased for those undertaking combinations of treatments. There is probably no difference between combinations and control in terms of the number of men experiencing surface- or skin-related side-effects but it is uncertain whether combinations of treatments lead to more men experiencing muscle-related side effects.

We did not identify any studies assessing electrical or magnetic stimulation versus no intervention, sham or verbal or written instructions that reported on our key outcomes of interest.

**What are the limitations of the evidence?**

The certainty of the evidence identified was mixed, ranging from very low-certainty to high-certainty evidence. Our concerns mainly surrounded how many participants were involved in the studies, as studies were often small. We also had concerns that there may have been bias introduced into many studies. Furthermore, it is uncertain whether evidence from open/laparoscopic surgery is applicable to robot-assisted radical prostatectomy.

**How up to date is this evidence?**

The evidence is up to date to 22 April 2022.

## SUMMARY OF FINDINGS

### Summary of findings 1. Pelvic floor muscle training (PFMT) plus biofeedback versus no treatment, sham treatment or verbal/written instruction

**PFMT plus biofeedback compared with no treatment, sham treatment or verbal/written instruction for urinary incontinence in men after prostate surgery**

**Patient or population:** men with urinary incontinence following prostate surgery

**Settings:** hospital or academic urology centres

**Intervention:** PFMT plus biofeedback

**Comparison:** no treatment, sham treatment or verbal/written instruction

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Certainty of the evidence (GRADE) | Comments |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | No treatment or sham treatment | PFMT plus biofeedback | | | | |
| **Subjective cure or improvement:** patient-reported as defined by the trialists, > 6 to 12 months | The study reported that 26/50 (52%) of participants in the PFMT plus biofeedback group were cured compared with 22/52 (42%) in the control group. | | - | 102 (1 study) | LOW[a, b] | Continent according to a score of 0 on a 0-10 VAS scale. Follow-up: 12 months |
| **Condition-specific quality of life:** using validated questionnaires, > 6 to 12 months | - | | - | - | - | Not reported |
| **Objective cure or improvement:** > 6 to 12 months | Two studies reported that men in the intervention group may leak more than those in the control group. | | - | 269 (2 studies) | LOW[a, c] | Follow-up was 12 months in both studies. |
| **Participant adherence to the intervention:** as reported by the trialists, > 6 to 12 months | - | - | - | - | - | Not reported |
| **General quality of life:** > 6 to 12 months | - | - | - | - | - | Not reported |
| **Number of participants experiencing surface or skin-related adverse events:** e.g. skin reactions, bruising, hypersensitivity to gel | No adverse events were reported in either group. | | - | 205 (1 study) | VERY LOW[a, d] | - |

| | | | | | |
|---|---|---|---|---|---|
| **Number of participants experiencing muscle-related adverse events:** e.g. soreness, discomfort, cramps, pain | No adverse events were reported in either group. | - | 205 (1 study) | VERY LOW[a, d] | - |

*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; VA**S:** visual analogue scale

**GRADE Working Group grades of evidence**
**High certainty:** we are very confident that the true effect lies close to that of the estimate of the effect.
**Moderate certainty:** we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
**Low certainty:** our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
**Very low certainty:** we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a] Downgraded once for imprecision: fewer than 400 participants overall
[b] Downgraded once for risk of bias: concerns about blinding of participants and personnel
[c] Downgraded once for risk of bias: concerns about attrition bias and selective reporting
[d] Downgraded twice for risk of bias: concerns about blinding of participants and personnel, attrition bias and selective reporting

## Summary of findings 2. Electrical or magnetic stimulation versus no treatment, sham treatment or verbal/written instruction

**Electrical or magnetic stimulation compared with no treatment, sham treatment or verbal/written instructions for urinary incontinence in men after prostate surgery**

**Patient or population:** men with urinary incontinence following prostate surgery

**Settings:** not applicable (no studies identified)

**Intervention:** electrical or magnetic stimulation

**Comparison:** no treatment, sham treatment or verbal/written instruction

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Certainty of the evidence (GRADE) | Comments |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | No treatment or sham treatment | Electrical or magnetic treatment | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Subjective cure or improvement:** patient-reported as defined by the trialists, > 6 to 12 months | - | - | - | - | - | Not reported |
| **Condition-specific quality of life:** using validated questionnaires, > 6 to 12 months | - | - | - | - | - | Not reported |
| **Objective cure or improvement:** > 6 to 12 months | - | - | - | - | - | Not reported |
| **Participant adherence to the intervention:** as reported by the trialists, > 6 to 12 months | - | - | - | - | - | Not reported |
| **General quality of life:** > 6 to 12 months | - | - | - | - | - | Not reported |
| **Number of participants experiencing surface or skin-related adverse events:** e.g. skin reactions, bruising, hypersensitivity to gel | - | - | - | - | - | Not reported |
| **Number of participants experiencing muscle-related adverse events:** e.g. soreness, discomfort, cramps, pain | - | - | - | - | - | Not reported |

*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 certainty:** we are very confident that the true effect lies close to that of the estimate of the effect.
**Moderate certainty:** we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
**Low certainty:** our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
**Very low certainty:** we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

## Summary of findings 3. Combinations of conservative treatments versus no treatment, sham treatment or verbal/written instruction

**Combinations of conservative treatments compared with no treatment, sham treatment or verbal/written instruction for urinary incontinence in men after prostate surgery**

**Patient or population:** men with urinary incontinence following prostate surgery

**Settings:** hospitals and teaching hospitals

**Intervention:** combinations of conservative treatments

**Comparison:** no treatment, sham treatment or verbal/written instruction

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Certainty of the evidence (GRADE) | Comments |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | No treatment or sham treatment | Combinations of conservative treatments | | | | |
| **Subjective cure or improvement:** patient-reported as defined by the trialists, > 6 to 12 months | 307 per 1000 | 297 per 1000 (242 to 365) | RR 0.97 (95% CI 0.79 to 1.19) | 788 (2 studies) | LOW[a, b] | Measured on two questions of ICI-SF at 12 months |
| **Condition-specific quality of life:** using validated questionnaires, > 6 to 12 months | - | - | MD -0.28 (95% CI -0.86 to 0.29) | 788 (2 studies) | MODERATE[b] | Based on ICIQ-Q score (higher score = worse quality of life) at 12 months |
| **Objective cure or improvement:** > 6 to 12 months | - | - | MD 0.18 (95% CI -0.24 to 0.60) | 565 (2 studies) | HIGH | Based on frequency of UI from diaries at 12 months |
| **Participant adherence to the intervention:** as reported by the trialists, > 6 to 12 months | 172 per 1000 | 358 per 1000 (134 to 958) | RR 2.08 (95% CI 0.78 to 5.56) | 763 (2 studies) | VERY LOW[a, b, c] | Based on undertaking PFMT every day at 12 months |
| **General quality of life:** > 6 to 12 months | - | - | MD -0.01 (95% CI -0.04 to 0.02) | 742 (2 studies) | MODERATE[b] | Based on EQ-5D (higher score = better health) at 12 months |
| **Number of participants experiencing surface or skin-related adverse events:** e.g. skin reactions, bruising, hypersensitivity to gel | No adverse effects were reported in either study | | - | 853 (2 studies) | MODERATE[b] | |
| **Number of participants experiencing muscle-related adverse events:** e.g. soreness, discomfort, cramps, pain | 0 per 1000 (0 to 0) | 0 per 1000 | RR 2.92 (95% CI 0.31 to 27.41) | 136 (2 studies) | VERY LOW[b, d, e] | Based on both studies reporting on discomfort due to treatment |

*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; **ICIQ:** International Consultation on Incontinence Questionnaire; **RR:** Risk Ratio;**UI:** urinary incontinence

**GRADE Working Group grades of evidence**
**High certainty:** we are very confident that the true effect lies close to that of the estimate of the effect.
**Moderate certainty:** we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
**Low certainty:** our confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect.
**Very low certainty:** we have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect.

[a] Downgraded once for imprecision: wide 95% CI suggests both benefit and harm
[b] Downgraded once for risk of bias: concerns about blinding of participants and personnel
[c] Downgraded once for inconsistency: $I^2$ over 75%
[d] Downgraded twice for imprecision: fewer than 400 participants overall and wide 95% CI suggests both benefit and harm
[e] Downgraded once for imprecision: small number of events

# BACKGROUND

For a glossary of terms used, see Appendix 1.

## Description of the condition

Urinary incontinence (UI) in men, especially older men, may be multifactorial and can be broadly attributed to non-neurologic and neurologic causes (Hester 2017). The International Continence Society (ICS) defines urinary incontinence as the "complaint of an involuntary loss of urine" (D'Ancona 2019). It can be further categorised as urgency urinary incontinence (UUI; the loss of urine associated with a sudden strong desire to urinate), stress urinary incontinence (SUI; involuntary loss of urine on effort or physical exertion (e.g. when sneezing, coughing or laughing)), or mixed urinary incontinence (MUI; where a person has both UUI and SUI).

The prostate is a walnut-sized gland which helps to make semen. It is located below the urinary bladder and wraps around the urethra (the channel allowing urine from the urinary bladder to leave the body). Enlargement of the prostate may be associated with difficulties in urination, such as a weak or intermittent urinary stream, a more frequent or urgent urination, nocturia (waking up in the night to go to the toilet) and a prolonged dribbling at the end of urination, among others. Such symptoms are termed lower urinary tract symptoms (LUTS). Benign (non-cancerous) prostate enlargement may block the urinary bladder outlet, preventing urine flow (known as benign prostatic obstruction (BPO)). BPO is relatively common in older men and, when symptoms are minimally bothersome, it can often be managed with lifestyle changes. Men with moderate to severe LUTS are usually managed with medications if conservative treatment has failed or is not appropriate (NICE 2015). Surgery for treating LUTS secondary to BPO (LUTS/BPO) aims to remove the excess prostate tissue blocking the urethra and preventing urine flow. It may be offered to men whose symptoms have not resolved after alternative options have been explored or men who present with complications of BPO. Surgical options include transurethral resection of the prostate (TURP) and various laser-based techniques such as holmium laser enucleation of the prostate, where the central obstructing part of the prostate (adenoma) is removed using electricity through a loop of thin wire or laser energy, respectively. On the other hand, surgery offered to men with prostate cancer - radical prostatectomy (RP) - aims to remove the entire prostate gland harbouring the cancer.

Men with LUTS, as well as those with prostate cancer, may develop urinary incontinence as a consequence of surgery (Sandhu 2019). Gravas 2022 reported the prevalence of urinary incontinence after TURP as 2.2%. Birder 2017 indicated that 2% to 60% of men report urinary incontinence after radical prostatectomy. Although urinary incontinence often improves in the early postoperative period, Nelson 2020 reported that 3.6% of men who have undergone radical prostatectomy will eventually have a surgical procedure for urinary incontinence. Several factors have been reported that may affect the risk of developing urinary incontinence following radical prostatectomy, including advanced age, obesity, a history of TURP, a higher tumour stage or grade, higher prostate-specific antigen levels, a larger prostate volume or preoperative detrusor overactivity (Goldman 2017; Heesakkers 2017; Kim 2016; Lardas 2022; Pastore 2017). The experience of the surgeon may also have a significant impact, with lower urinary incontinence rates at centres performing large numbers of radical prostatectomies (Chen 2019; Fossati 2017).

The type of surgery applied for treating LUTS/BPO may influence the risk of urinary incontinence, which is attributed to direct external sphincter injury during surgery, often reflecting the surgeon's level of experience (Rassweiler 2006; Shigemura 2016). However, comparative data from randomised controlled trials (RCTs) evaluating the risk of urinary incontinence after the various types of surgery for treating LUTS/BPO are scarce (Cornu 2015). Urinary incontinence following radical prostatectomy can be due to various reasons, including direct injury to the internal sphincter or injury to the structure supporting the urethra. External sphincter dysfunction is the primary abnormality in most cases with severe urinary incontinence, regardless of the presence of abnormal bladder function (Holm 2015). External sphincter dysfunction can be caused during the surgery by inadvertent injury to the external sphincter or damage to the pudendal nerve that innervates (supplies nerves to) this mechanism, or be due to the loss of pliability associated with postoperative fibrosis (formation of scar tissue) (Arcila-Ruiz 2018; Goldman 2017). External sphincter dysfunction is the most common cause of refractory SUI (which does not resolve on its own) following radical prostatectomy (Arcila-Ruiz 2018).

Urinary incontinence has a significant economic cost. The economic burden of urinary incontinence following radical prostatectomy is comparable to that of the instigating surgery (Lent 2015). The estimated economic burden of managing urinary incontinence in men in the USA was USD 18.8 billion (USD 18,800 million, USD 1998/1999), with a trend showing a rapid increase for men above the age of 65 years (Stothers 2005). Urinary incontinence was associated with an annual per-person expenditure of USD 7702 (USD 1998/1999), which was more than double those without the condition (Stothers 2005). Urinary incontinence also has a significant impact on the personal well-being of both men and women, with an increased prevalence of mental health problems (Cheng 2020).

## Description of the intervention

Where possible, urinary incontinence following prostate surgery is managed conservatively. Lifestyle management options include moderating caffeine intake, physical exercise, modifying diet or fluid intake, weight loss and smoking cessation (Imamura 2015).

Pelvic floor muscle training (PFMT), described by the joint terminology document of the International Urogynecology Association (IUGA)/International Continence Society (ICS), as exercises to improve pelvic floor muscle strength, endurance, power, relaxation, or a combination of these parameters (Bo 2017), may also be suggested (Rahnama'i 2021). PFMT may be combined with biofeedback, which utilises an external sensor to give an indication of the muscle activity, which in turn helps the individual to improve their techniques (Bo 2017). Biofeedback includes electromyographic feedback from anal or perineal electrodes or feedback from manometry or ultrasonography (Berghmans 2020; Nunes 2019). In its simplest form, biofeedback could be verbal communication by an assessor who confirms the contraction (or relaxation) of the pelvic floor by physical examination.

In some cases, electrical stimulation (ES) is offered to men with urinary incontinence following prostate surgery. Electrical stimulation can be applied through three routes:

- intracavitary (intrarectal) or perineal surface electrical stimulation: used to directly stimulate the urethral sphincter and pelvic floor muscles;
- percutaneous stimulation: applied to the posterior tibial nerve with a fine needle, which is inserted just above the medial aspect of the ankle (P-PTNS); or
- transcutaneous surface stimulation: applied to the posterior tibial nerve for treating UUI (T-PTNS).

A less invasive treatment is magnetic stimulation therapy, which is the application of a magnetic flux to stimulate the pelvic floor, urethral sphincter and perineal muscles. It can be applied through clothing without the need for surface electrodes or intracavitary probes.

### How the intervention might work

There is uncertainty about the benefit of conservative treatments for men with urinary incontinence after prostate surgery. Much of the evidence base for the effect of individual lifestyle interventions for the treatment of urinary incontinence is limited or inconsistent (Gacci 2022; Gravas 2022). The effects on urinary incontinence of reducing caffeine and fluid intake, regular exercise and reducing weight have mostly been studied in women (Danforth 2006; Hannestad 2003; Harding 2021; Hunskaar 2008; Subak 2009). However, it is possible that these effects could be broadened to men.

Three proposed theorised mechanisms guide current PFMT approaches. 'Enhanced Pelvic Floor Muscle Strength,' pertaining to increasing the cross-sectional area of the key support muscle underlying the urethra (Bø 2004; Sheng 2022). The second mechanism is 'Maximed Awareness of Timing,' pertaining to enhanced personal control over improving urethral closure pressure momentarily in a moment of need. Finally, the third mechanism is 'strengthened core muscles', which is derived from the supposition that contraction of the core abdominal muscles elicits a co-contraction of the PFM reflexively. PFMT improves bladder outlet resistance, which is confirmed by both subjective and objective tests, with a reduction in the volume, symptoms and bother of urinary incontinence following prostate surgery. PFMT may results in hypertrophy of the peri-urethral striated muscles, thereby increasing the 'external mechanical pressure' on the urethra and potentially preventing incontinence (Rahnama'i 2021). PFMT has been shown to improve UUI both by inhibiting the bladder during storage as well as by urethral obstruction (Dumoulin 2017).

Electrical stimulation can be used to treat the sphincteric weakness associated with SUI or for the treatment of UUI with or without detrusor overactivity. Magnetic stimulation has been used to resolve detrusor overactivity for UUI, as well as for SUI by passive stimulation of the pelvic floor (Lim 2015).

### Why it is important to do this review

The value of the various approaches to conservative management of urinary incontinence after prostate surgery remains uncertain, and the evidence is conflicting. This review aims to summarise the best available evidence in an attempt to provide definite answers on the value of the conservative management options available for urinary incontinence following any type of surgery.

## OBJECTIVES

To assess the effects of conservative interventions for managing urinary incontinence after prostate surgery.

## METHODS

### Criteria for considering studies for this review

#### Types of studies

We included randomised controlled trials (RCTs) and quasi-RCTs (studies that are not necessarily random, e.g. allocated by day of the week) assessing conservative interventions for managing urinary incontinence following prostate surgery.

We excluded cross-over RCTs and cluster-RCTs because neither study designs is appropriate for addressing the review question. For a cross-over study, this is because it is inappropriate to assess long-term performance. In addition, an effective treatment provided in the first period of a cross-over study cannot clearly be separated from the second period. Cluster-randomised designs are adopted to avoid contamination between randomised groups, an issue that would be less important for this study question.

#### Types of participants

We included studies of adult men (aged 18 or over) with urinary incontinence following prostate surgery for treating prostate cancer or LUTS/BPO. We included studies where men have undergone either radical prostatectomy (open, laparoscopic or robot-assisted) or any one of the established techniques of prostate surgery for treating LUTS/BPO: monopolar transurethral resection of the prostate (M-TURP); bipolar transurethral resection of the prostate (B-TURP); thulium laser vaporesection of the prostate (ThuVAPR); transurethral incision of the prostate (TUIP); open prostatectomy (OP); bipolar transurethral enucleation of the prostate (B-TUEP); holmium laser enucleation of the prostate (HoLEP); thulium laser enucleation of the prostate (ThuLEP); diode laser enucleation of the prostate (DiLEP); bipolar transurethral vaporisation of the prostate (B-TUVP); 532 nm ('Greenlight') laser vaporisation of the prostate; and prostatic urethral lift (PUL)) (Gravas 2022).

We only included studies of men with urinary incontinence after prostate surgery has been performed. We did not include studies of men who had urinary incontinence prior to prostate surgery, or studies in which there is a mixed population of men (i.e. those who did and did not have urinary incontinence prior to surgery), unless data for those who subsequently developed urinary incontinence were presented separately. Additionally, we excluded studies if randomisation to groups occurred before prostate surgery and any study where randomisation took place before catheter removal after prostate surgery.

#### Types of interventions

We included any studies where at least one arm includes a conservative intervention for treating urinary incontinence after prostate surgery (see Description of the intervention for further details). We excluded trials comparing conservative management options with medical or surgical treatments.

Due to the major difference in the aetiology of urinary incontinence following radical prostatectomy and prostatic surgery for LUTS/BPO, had data allowed we would have explored the effects

of conservative interventions on these procedures through subgroup analysis (see Subgroup analysis and investigation of heterogeneity).

We included these comparisons:

- PFMT versus no treatment, sham treatment or verbal and written instructions;
- PFMT plus biofeedback versus no treatment, sham treatment or verbal and written instructions;
- Electrical or magnetic stimulation versus no treatment, sham treatment or verbal and written instructions;
- Lifestyle interventions versus no treatment, sham treatment or verbal and written instructions;
- Combinations of conservative treatments versus no treatment, sham treatment or verbal and written instructions; and
- PFMT plus electrical stimulation versus PFMT or other exercise alone.

In this review, 'sham treatment' means any treatment that could not influence the pelvic floor muscles, such as placing an electrical stimulation probe in the anus but not turning it on. We split comparisons with PFMT as no treatment or sham treatment is 'passive', whereas receiving verbal or written instructions can be considered 'active' in that they may encourage people to undertake PFMT, which could further affect results. Biofeedback is often given as an adjunct to PFMT to improve its effectiveness. Biofeedback was considered to be an intervention if it was delivered on an ongoing basis, rather than as a singular adjunct of a training session. This is because biofeedback on the day of PFMT training is mandatory. Combinations of conservative treatments could encompass any of the other conservative treatments listed in the interventions above (e.g. PFMT combined with one or more lifestyle interventions).

We considered 'PFMT plus biofeedback versus no treatment or sham treatment', 'electrical or magnetic stimulation versus no treatment or sham treatment' and 'combinations of conservative treatments versus no treatment or sham treatment' for the summary of findings tables as these comparisons help to answer whether conservative treatments may be beneficial in managing urinary incontinence after prostate surgery.

### Types of outcome measures

We assessed the following outcome measures.

#### *Primary outcomes*

- Subjective cure or improvement (patient-reported as defined by the trialists)
- Condition-specific quality of life assessed using validated questionnaires (e.g. International Consultation on Incontinence Questionnaire Urinary Incontinence Short Form (ICIQ-UI-SF) or ICIQ-SF)

#### *Secondary outcomes*

- Objective cure or improvement of urinary incontinence (e.g. pad test per 24 hours, frequency per 24 hours or other standardised test)
- Participant adherence to the intervention (as reported by the trialists)
- General quality of life (e.g. Short Form 36 (Ware 1993))
- Number of participants experiencing surface or skin-related adverse events (e.g. skin reactions, bruising, hypersensitivity to gel)
- Number of participants experiencing general muscle-related adverse events (e.g. soreness, discomfort, cramps, pain)
- Number of participants experiencing adverse events relating to the viscera or anorectum (e.g. bowel dysfunction or painful defecation, for example after a intracavitary rectal probe, or erectile dysfunction)

#### Timing of outcome assessment

We assessed outcomes in the short term (≥ 3 to 6 months) and long term (> 6 to 12 months).

#### Main outcomes for summary of findings tables

We included the following outcome measures in the summary of findings tables.

- Subjective cure or improvement (patient-reported as defined by the trialists)
- Condition-specific quality of life assessed using validated questionnaires (e.g. International Consultation on Incontinence Questionnaire Urinary Incontinence Short Form (ICIQ-UI-SF) or ICIQ-SF)
- Objective cure or improvement of urinary incontinence (e.g. pad test per 24 hours, frequency per 24 hours or other standardised test)
- Participant adherence to the intervention (as reported by the trialists)
- General quality of life (e.g. Short Form 36 (Ware 1993))
- Number of participants experiencing surface or skin-related adverse events (e.g. skin reactions, bruising, hypersensitivity to gel)
- Number of participants experiencing general muscle-related adverse events (e.g. soreness, discomfort, cramps, pain)

We measured outcomes for the summary of findings tables in the long term (> 6 to 12 months).

## Search methods for identification of studies

We did not impose any language or other limitations on any of the searches described below.

### Electronic searches

#### *Search for clinical effectiveness studies*

We identified relevant trials from the Cochrane Incontinence Specialised Register. For more details of the search methods used to build the Specialised Register, please see the Group's webpages where details of the Register's development (from inception) and the most recent searches performed to populate the Register can be found. To summarise, the Register contains trials identified from the Cochrane Central Register of Controlled Trials (CENTRAL) (via CRS Web), MEDLINE, MEDLINE In-Process, In-Data-Review and Other Non-Indexed Citations, MEDLINE Epub Ahead of Print, MEDLINE Daily (all via Ovid), ClinicalTrials.gov, and WHO ICTRP, and handsearching of journals and conference proceedings. The Cochrane Incontinence Specialised Register searches were current as at 4 April 2022. Many of the trials in the Cochrane Incontinence Specialised Register are also contained in CENTRAL.

The date of the most recent search of the Cochrane Incontinence Specialised Register for this review was 22 April 2022.

The terms that we used to search the Cochrane Incontinence Specialised Register are given in Appendix 2.

### Searching other resources

We searched the reference lists of included studies and any relevant systematic reviews to identify other potentially eligible trials.

## Data collection and analysis

We conducted data collection and analysis in accordance with methods specified in the *Cochrane Handbook for Systematic Reviews of Interventions* (hereafter referred to as the *Cochrane Handbook,* Higgins 2019).

### Selection of studies

Two review authors (EJ and either SS and AS) independently screened the titles and abstracts identified by the search. We obtained the full texts of any potentially relevant reports and assessed these against our eligibility criteria. The two review authors compared results and resolved any disagreements through discussion or arbitration by a third review author (MIO or CM) if necessary.

### Data extraction and management

Two review authors (EJ and either SS or AS) independently extracted information from included studies using a pre-piloted data extraction form. The two review authors discussed their individual extractions and came to a consensus. We resolved any disagreements through discussion or arbitration by a third review author (MIO or CM) if necessary.

### Assessment of risk of bias in included studies

We used the Cochrane 'Risk of bias tool to assess the risk of bias in included studies (Chapter 8 of the *Cochrane Handbook*; Higgins 2011). Two review authors (EJ and either SS or AS) independently assessed each eligible study against each of the six domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessors, incomplete outcome data, selective reporting and other potential sources of bias. We rated each domain as either 'high', 'unclear' or 'low' risk of bias for each study. We resolved any disagreements through discussion or arbitration by a third review author (MIO).

### Measures of treatment effect

For dichotomous outcomes, we measured treatment effect using risk ratios (RRs) with their corresponding 95% confidence intervals (CIs). For continuous outcome data, we used mean difference (MD) with corresponding 95% CI.

Where continuous outcomes were reported using different scales, we used standardised mean difference (SMD) and 95% CI if the scales were reported using similar means (e.g. higher score equals more positive result). We interpreted SMD as per the thresholds reported by Cohen 1988:

- 0.2: small effect
- 0.5: moderate effect
- 0.8: large effect

### Unit of analysis issues

Where included studies had more than two treatment arms, we analysed each pair of arms in separate comparisons where appropriate. In order to avoid double-counting study participants in multi-arm studies that had three treatment arms that could be included in the same meta-analysis, we divided in half the number of participants and events for the arm that was included twice.

### Dealing with missing data

Where possible, we considered data on an intention-to-treat (ITT) basis. If ITT data were not available, we contacted the study authors of trials where data were missing or incomplete for further information. If we were unable to obtain this information from the study authors, we used per protocol data in meta-analyses but indicated where this was the case.

### Assessment of heterogeneity

We assessed the level of heterogeneity within meta-analyses by calculating the $Chi^2$ and $I^2$ statistics using RevMan 5 software (Review Manager 2020). We used the thresholds indicated by the *Cochrane Handbook* (Higgins 2019):

- 0% to 40%: might not be important;
- 30% to 60%: may represent moderate heterogeneity;
- 50% to 90%: may represent substantial heterogeneity;
- 75% to 100%: considerable heterogeneity.

### Assessment of reporting biases

If more than 10 studies were included in a meta-analysis, we generated a funnel plot in RevMan 5 to determine whether small-study bias was present (Review Manager 2020).

### Data synthesis

We used RevMan 5 to perform meta-analyses, where possible (Review Manager 2020). We used the random-effects approach to meta-analysis (Higgins 2019).

Where multiplicity within studies was present (i.e. a single outcome measure for a single time point of relevance to the review was reported using multiple tools in a single study), we used a reductionist approach to determine which single measure appropriate to report for analysis (López-López 2018). Where possible, we used Cronbach's alpha reported from validation studies to determine the most appropriate measure; in these cases, we chose the tool that reported a score closest to one. If Cronbach's alpha was not available, we discussed the most relevant measures to use from a clinical perspective as a review team. Our decisions surrounding multiplicity within studies is documented in Table 1. If a single study reported two time points between those of interest to this review (e.g. a study reported outcomes at both four and six months), we took the latest time point available forward to analysis.

Where meta-analyses were not possible, we performed a narrative synthesis based on the principles of synthesis without meta-analysis (SWiM) (Campbell 2020).

### Subgroup analysis and investigation of heterogeneity

Had data allowed, we planned to perform the following subgroup analyses:

- type of urinary incontinence (SUI, UUI, MUI); and
- type of surgical procedure (prostate surgery for treating prostate cancer and prostate surgery for treating LUTS/BPO).

### Sensitivity analysis

We performed sensitivity analyses for studies within meta-analyses that were deemed to be at a high risk of bias. We would have judged any study assessed to be at 'high' risk for at least one domain to be at an overall high risk of bias.

Additionally, we performed sensitivity analyses on any study where it appeared as though the population assessed was men with UI after prostate surgery, but where this was not clearly specified in the inclusion criteria of the study.

### Summary of findings and assessment of the certainty of the evidence

We prepared summary of findings tables using the GRADEpro software for the main comparisons pre-stated in the Types of interventions (GRADEpro GDT). Where it was possible to conduct different types of analysis for a single outcome and time point (e.g. both dichotomous and continuous meta-analyses), we prioritised and reported only one type of analysis per outcome.

We used the GRADE approach to assess the certainty of evidence related to the primary and secondary outcomes as listed in the Types of outcome measures (Schünemann 2020). We used the five GRADE considerations (study limitations, consistency of effect, imprecision, indirectness and publication bias) to assess the certainty of the body of evidence for the prespecified outcomes. We justified all decisions to downgrade the certainty of studies using footnotes. Where other data that were not able to be meta-analysed were reported in the summary of findings tables, we used the approach described by Murad 2017 to determine the certainty of evidence.

## RESULTS

### Description of studies

#### Results of the search

We screened 2190 records identified by the literature searches (2187 from the Cochrane Incontinence Specialised Register and 3 from other sources). A total of 185 full-text articles were obtained for records that appeared to be eligible for inclusion in the review. We included 62 reports of 25 studies and excluded 107 reports of 66 studies. There were 38 reports of 14 studies included in the quantitative synthesis. Additionally we identified eight ongoing studies and there are eight reports of six studies that are awaiting classification. The flow of literature through the assessment process is shown in Figure 1.

**Figure 1. PRISMA study flow diagram**

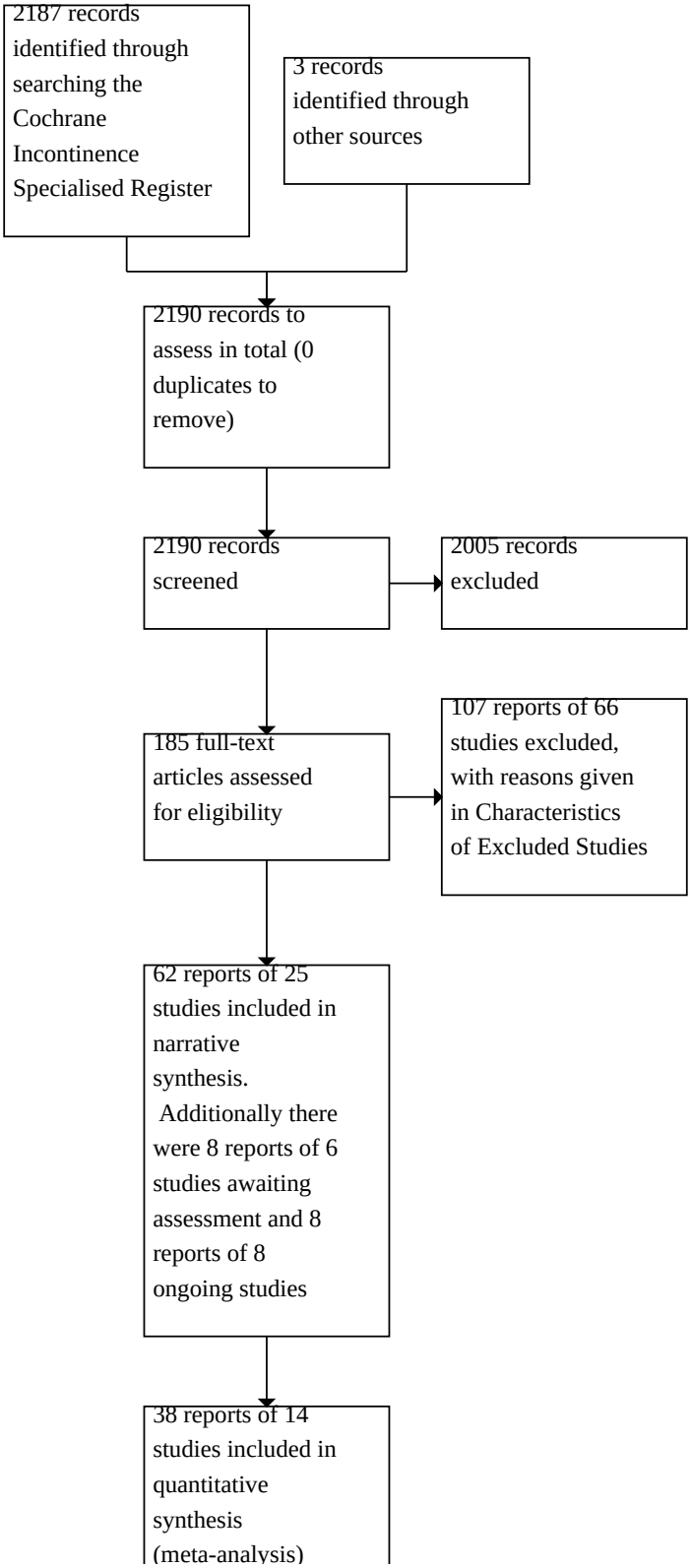


**Figure 1. (Continued)**

synthesis
(meta-analysis)

### Included studies

Further details can be found in the Characteristics of included studies.

#### *Design*

Twenty-four studies were randomised controlled trials (RCTs) (Ahmed 2012; Bennett 1996; Ceresoli 2002; Filocamo 2005; Franke 2000; Glazener 2011a; Glazener 2011b; Gomes 2018; Goode 2011; Kakihara 2007; Laurienzo 2018; Manassero 2007; Moore 1999a; Moore 2008; Morihiro 2011; Pedriali 2016; Robinson 2009; Sanchez-Salas 2021; Sangalli 2021; Serdà 2014; Strojek 2021; Van Kampen 2000; Yamanishi 2010; Zaidan de Barros 2014). One study was a quasi-RCT (Chen 2013).

#### *Sample size*

The smallest sample size was 25 (Chen 2013) and the largest was 442 (Glazener 2011b). Across all 25 studies, 3079 men were included and the average sample size was 123.

#### *Setting*

The included studies were set in the following countries: five in Brazil (Gomes 2018; Kakihara 2007; Laurienzo 2018; Pedriali 2016; Zaidan de Barros 2014); four in Italy (Ceresoli 2002; Filocamo 2005; Manassero 2007; Sangalli 2021); four in the USA (Bennett 1996; Franke 2000; Goode 2011; Robinson 2009); two in Canada (Moore 1999a; Moore 2008); two in Japan (Morihiro 2011; Yamanishi 2010); two in the UK (Glazener 2011a; Glazener 2011b); one in Belgium (Van Kampen 2000); one in China (Chen 2013); one in Egypt (Ahmed 2012); one in France (Sanchez-Salas 2021); one in Poland (Strojek 2021); and one in Spain (Serdà 2014).

Thirteen studies were conducted in a single centre (Ahmed 2012; Bennett 1996; Chen 2013; Franke 2000; Gomes 2018; Kakihara 2007; Laurienzo 2018; Manassero 2007; Pedriali 2016; Robinson 2009; Serdà 2014; Van Kampen 2000; Zaidan de Barros 2014). Five studies were performed across multiple sites (Glazener 2011a; Glazener 2011b; Goode 2011; Moore 1999a; Moore 2008). Setting was not reported in six studies (Ceresoli 2002; Filocamo 2005; Morihiro 2011; Sanchez-Salas 2021; Sangalli 2021; Yamanishi 2010).

#### *Study funding sources*

In total, four studies stated that they did not receive any funding (Morihiro 2011; Sanchez-Salas 2021; Sangalli 2021; Strojek 2021), while seven were funded solely by governmental organisations (Glazener 2011a; Glazener 2011b; Goode 2011; Laurienzo 2018; Robinson 2009; Van Kampen 2000; Zaidan de Barros 2014), and one solely by a foundation (Bennett 1996). One study was funded by a governmental organisation and a university (Chen 2013), one by a charity and a university (Moore 1999a), and one through both charity and a pharmaceutical company (Moore 2008). Ten studies did not report their funding sources (Ahmed 2012; Ceresoli 2002; Filocamo 2005; Franke 2000; Gomes 2018; Kakihara 2007; Manassero 2007; Pedriali 2016; Serdà 2014; Yamanishi 2010).

#### *Participants*

Fourteen studies clearly stated that the reason men underwent prostate surgery was due to prostate cancer (Ahmed 2012; Bennett 1996; Ceresoli 2002; Filocamo 2005; Glazener 2011a; Gomes 2018; Laurienzo 2018; Moore 2008; Pedriali 2016; Sangalli 2021; Serdà 2014; Strojek 2021; Van Kampen 2000; Yamanishi 2010). Nine did not clearly state why their participants were undergoing prostate surgery, but due to the nature of the procedure involved (usually radical prostatectomy (RP) or radical retropubic prostatectomy (RRP)), we assumed that it was due to prostate cancer (Chen 2013; Franke 2000; Goode 2011; Kakihara 2007; Moore 1999a; Morihiro 2011; Robinson 2009; Sanchez-Salas 2021; Zaidan de Barros 2014). In Glazener 2011b, men had undergone surgery due to benign prostatic hyperplasia (BPH).

Twenty-three studies took place after the participants had undergone RP (Ahmed 2012; Bennett 1996; Ceresoli 2002; Chen 2013; Filocamo 2005; Franke 2000; Glazener 2011a; Gomes 2018; Goode 2011; Kakihara 2007; Laurienzo 2018; Manassero 2007; Moore 1999a; Moore 2008; Morihiro 2011; Pedriali 2016; Robinson 2009; Sanchez-Salas 2021; Sangalli 2021; Strojek 2021; Van Kampen 2000; Yamanishi 2010; Zaidan de Barros 2014). Of these, 15 studies gave additional details about the nature of the surgery undertaken (e.g. laparoscopic, robot-assisted) (Ahmed 2012; Chen 2013; Filocamo 2005; Glazener 2011a; Gomes 2018; Kakihara 2007; Manassero 2007; Morihiro 2011; Pedriali 2016; Robinson 2009; Sanchez-Salas 2021; Sangalli 2021; Strojek 2021; Van Kampen 2000; Yamanishi 2010), though in seven studies these additional details were not described (Bennett 1996; Ceresoli 2002; Goode 2011; Laurienzo 2018; Moore 1999a; Moore 2008; Zaidan de Barros 2014). In Glazener 2011b, men had previously undergone transurethral resection of the prostate (TURP); the specific type of TURP (standard or laser) was also described. In Serdà 2014, the type of prostate surgery was not described and men undergoing radiotherapy in combination with androgen deprivation therapy were also included in the study.

Two studies reported that the men exclusively had stress urinary incontinence (SUI) (Bennett 1996; Strojek 2021). In Gomes 2018, Goode 2011 and Pedriali 2016, men either had SUI, urgency urinary incontinence (UUI or mixed urinary incontinence (MUI). In Kakihara 2007, men either had SUI or UUI. In two studies, men were reported to have SUI, UUI, MUI, postmicturition leakage or"other" incontinence (Glazener 2011a; Glazener 2011b). Serdà 2014 reported that men either had SUI, UUI), MUI or lower urinary tract symptoms (LUTS) with a pattern of MUI and/or nocturia but were not diagnosed with UI. Fourteen studies did not report the type of UI that the men had (Ahmed 2012; Ceresoli 2002; Filocamo 2005; Franke 2000; Laurienzo 2018; Manassero 2007; Moore 2008; Morihiro 2011; Robinson 2009; Sanchez-Salas 2021; Sangalli 2021;

Van Kampen 2000; Yamanishi 2010; Zaidan de Barros 2014), while it was unclear in one study (Chen 2013). In Moore 1999a, it is noted that four men had urodynamically-proven SUI but no other details were provided.

The average age of men in 11 studies was generally over 65 (Bennett 1996; Chen 2013; Filocamo 2005; Glazener 2011b; Gomes 2018; Goode 2011; Manassero 2007; Moore 1999a; Serdà 2014; Yamanishi 2010; Zaidan de Barros 2014), while the average age of men was under 65 in seven studies (Ahmed 2012; Franke 2000; Glazener 2011a; Kakihara 2007; Laurienzo 2018; Robinson 2009; Strojek 2021). In Pedriali 2016, men were generally aged over 65 in two groups, while in the control group men were generally aged under 65. In Van Kampen 2000, the total average age of participants was 65. Participants' age was not reported in five studies (Ceresoli 2002; Moore 2008; Morihiro 2011; Sanchez-Salas 2021; Sangalli 2021).

The average body mass index (BMI) of men in one study was over 30 (Ahmed 2012), while in seven the average BMI was generally under 30 (Glazener 2011a; Glazener 2011b; Goode 2011; Laurienzo 2018; Robinson 2009; Serdà 2014; Strojek 2021). Fifteen studies did not report the participants' BMI (Bennett 1996; Ceresoli 2002; Filocamo 2005; Gomes 2018; Kakihara 2007; Manassero 2007; Moore 1999a; Moore 2008; Morihiro 2011; Pedriali 2016; Sanchez-Salas 2021; Sangalli 2021; Van Kampen 2000; Yamanishi 2010; Zaidan de Barros 2014), while it was unclear in one study (Chen 2013).

### *Interventions*

The studies included the following interventions.

- Pelvic floor muscle training (PFMT) (Filocamo 2005; Laurienzo 2018; Manassero 2007; Moore 1999a; Robinson 2009; Serdà 2014; Strojek 2021)
- PFMT and biofeedback (Moore 2008; Robinson 2009; Sanchez-Salas 2021; Van Kampen 2000)
- Electrical stimulation (Ahmed 2012)
- Lifestyle interventions, including Pilates (Gomes 2018; Pedriali 2016)
- Combinations of conservative treatments (Ahmed 2012; Bennett 1996; Chen 2013; Franke 2000; Glazener 2011a; Glazener 2011b; Gomes 2018; Goode 2011; Laurienzo 2018; Moore 1999a)
- PFMT and electrical stimulation (Ceresoli 2002; Kakihara 2007; Laurienzo 2018; Moore 1999a; Morihiro 2011; Pedriali 2016; Sangalli 2021; Yamanishi 2010; Zaidan de Barros 2014)

In terms of comparisons, nine studies compared an intervention with no treatment (Filocamo 2005; Franke 2000; Gomes 2018; Goode 2011; Laurienzo 2018; Manassero 2007; Pedriali 2016; Serdà 2014; Strojek 2021). Four studies compared with instructions to perform PFMT or another intervention (Ahmed 2012; Moore 1999a; Robinson 2009; Sanchez-Salas 2021). In three of these studies, both written and verbal instructions were provided (Ahmed 2012; Moore 1999a; Robinson 2009). In one study, participants received written instructions only (Moore 2008). In Glazener 2011a and Glazener 2011b, participants in the control group received a written leaflet that did not reference PFMT alongside standard care; the study authors acknowledged that standard care may have varied across the different study sites and may have included an "active" control, such as written advice. The method of instruction was unclear in one study (Sanchez-Salas 2021).

Two studies compared with sham electrical stimulation (Bennett 1996; Van Kampen 2000), while one study compared with PFMT plus sham stimulation (Yamanishi 2010). Ceresoli 2002 compared a combined intervention with catheter clamping training, which was conventional care. PFMT was the sole comparator in five studies (Ceresoli 2002; Kakihara 2007; Morihiro 2011; Sangalli 2021; Zaidan de Barros 2014).

Intervention and comparator protocols varied between the studies. More detailed information on how interventions and comparators were delivered for each study are presented in the Characteristics of included studies.

### *Outcomes*

In terms of studies assessing our primary outcomes at the time points specified for this review, the following reported usable data.

- Subjective cure or improvement (Bennett 1996; Filocamo 2005; Glazener 2011a; Glazener 2011b; Goode 2011; Kakihara 2007; Laurienzo 2018; Moore 2008; Morihiro 2011; Van Kampen 2000; Yamanishi 2010)
- Condition-specific quality of life (Ahmed 2012; Glazener 2011a; Glazener 2011b; Gomes 2018; Goode 2011; Kakihara 2007; Laurienzo 2018; Manassero 2007; Moore 1999a; Moore 2008; Pedriali 2016; Strojek 2021; Yamanishi 2010)

With regard to this review's secondary outcomes, the following were reported at the time points we pre-specified.

- Objective cure or improvement (Ahmed 2012; Bennett 1996; Ceresoli 2002; Filocamo 2005; Franke 2000; Gomes 2018; Glazener 2011a; Glazener 2011b; Goode 2011; Kakihara 2007; Laurienzo 2018; Lin 2011; Manassero 2007; Moore 1999a; Moore 2008; Pedriali 2016; Sanchez-Salas 2021; Van Kampen 2000; Yamanishi 2010; Zaidan de Barros 2014)
- Participant adherence to intervention (Glazener 2011a; Glazener 2011b; Goode 2011)
- General quality of life (Glazener 2011a; Glazener 2011b; Goode 2011; Yamanishi 2010)
- Adverse events (Glazener 2011a; Glazener 2011b; Gomes 2018; Moore 1999; Moore 2008; Morihiro 2011; Pedriali 2016; Yamanishi 2010)

Outcomes measured within the included studies were often very varied, particularly in terms of the tools and methods used to measure outcomes. More information about this can be found in within the Characteristics of included studies.

### *Contact with study authors*

We contacted the authors of 11 included studies for additional information (Ceresoli 2002; Laurienzo 2018; Manassero 2007; Moore 2008; Pedriali 2016; Robinson 2009; Sanchez-Salas 2021; Sangalli 2021; Serdà 2014; Strojek 2021; Zaidan de Barros 2014). We received responses from seven of these (Ceresoli 2002; Manassero 2007; Moore 2008; Pedriali 2016; Robinson 2009; Sanchez-Salas 2021; Zaidan de Barros 2014). Further information can be found in the Characteristics of included studies.

## Excluded studies

In total, we excluded 66 studies.

Ten studies had an ineligible study design. Four were not RCTs (Abbinante 2012; Ceresoli 1995; Jackson 1996; Salinas Casado 1996), and four were cross-over studies (Fode 2015; Nehra 2001; Radzimińska 2019; Simeit 2010). Two studies were reviews (Hsu 2016; Moore 1999b).

Twenty-three studies had an ineligible population. Six of these were conducted in women (Abel 1996; Azevedo 2020; Bernier 2008; Bourcier 1994; Oldham 2001; Parsons 2004), while two assessed both men and women (Bryant 2001; Yamanishi 1996). Fourteen studies randomised the participants before surgery (Allameh 2021; Arruda 2007; Au 2020; Burnett 2012; Franke 1998; Montazeri 2020; Jalalinia 2020; Mathewson-Chapman 1997; Overgård 2008; Park 2012; Perissinotto 2008; Robinson 2008; Sacco 2011; Wille 2003). One study recruited men with erectile dysfunction, not post-prostatectomy UI (Karlsen 2021).

Five studies contained an ineligible intervention. Aydın Sayilan 2018 used acupuncture as part of its intervention, while in Feng 2000 and Griebling 1999 the intervention commenced before prostate surgery. In Tantawy 2019, the intervention of interest was whole body vibration. Yang 2022 assessed Peplau nursing, which included concepts of Peplau interpersonal relationship theory; the control group also received bladder training in addition to routine care.

Twenty-seven studies had ineligible comparators (Baroni 2013; Amend 2018; Feng 2022; Floratos 2002; Heerey 2016; Heydenreich 2016; Heydenreich 2020; Joseph 2000; Kaya 2021; Kim 2009; Liu 2008; Marchiori 2010; Mariotti 2009; Meng 2012; Novick 2014; Nowak 2007; Oh 2020; Opsomer 1994; Pané-Alemany 2021; Santos 2017; Seleme 2008; Soto González 2020; Steenstrup 2017; Wang 2018a; Yokoyama 2004; Zachovajevienė 2019; Zhang 2007).

Finally, one study was excluded due to ineligible outcomes (Zhang 2015).

More details can be found in the Characteristics of excluded studies.

### Studies awaiting classification

We identified six studies awaiting classification (Hoffmann 2005; Mozafari 2021; Lin 2011; Gezginci 2020; Ribeiro 2010; Wang 2018b). Further details can be found in the Characteristics of studies awaiting classification.

### Ongoing studies

We identified eight ongoing studies (Okhovatian 2021; Lordelo 2017; Peters 2019; Celenay 2021; Celenay 2022; Yıldız 2022; Unal 2020; Zaidan 2019). Further information can be found in the Characteristics of ongoing studies.

## Risk of bias in included studies

Summaries of risk of bias assessments can be seen in Figure 2 and Figure 3. Further details can be found in the Characteristics of included studies.

**Figure 2. Risk of bias graph: review authors' judgements about each risk of bias item for each included study.**

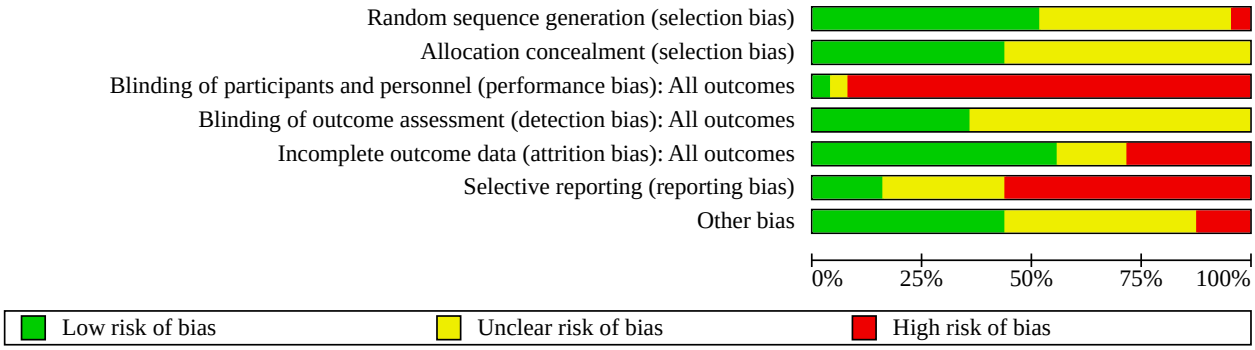


**Figure 3. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.**

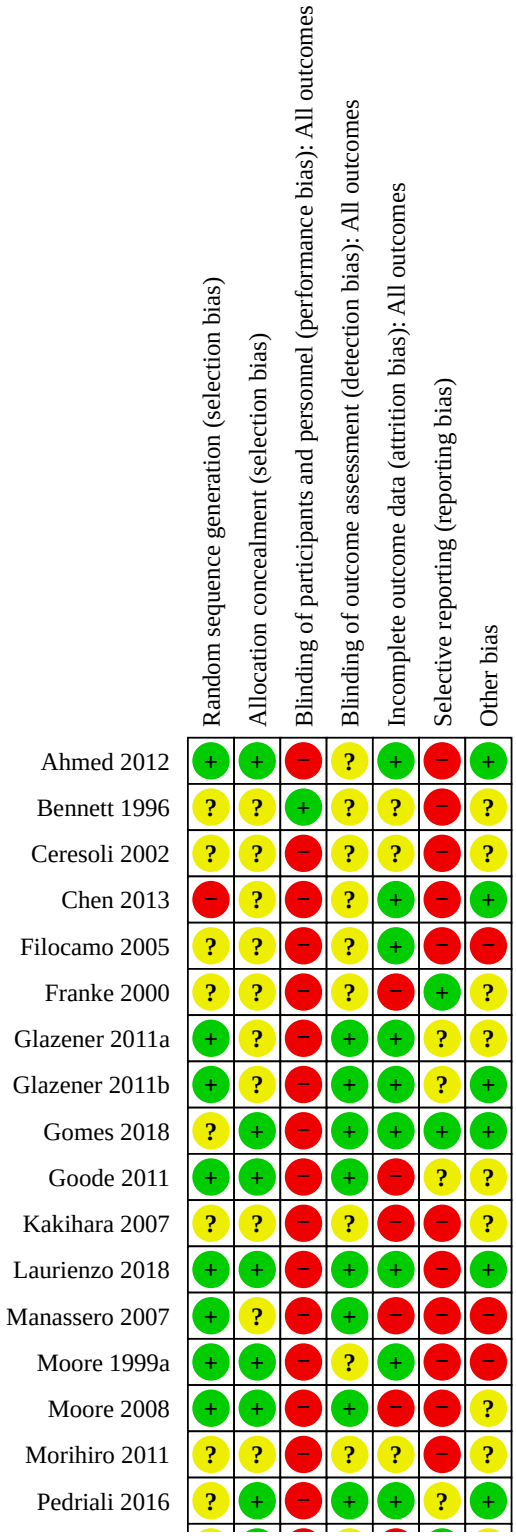
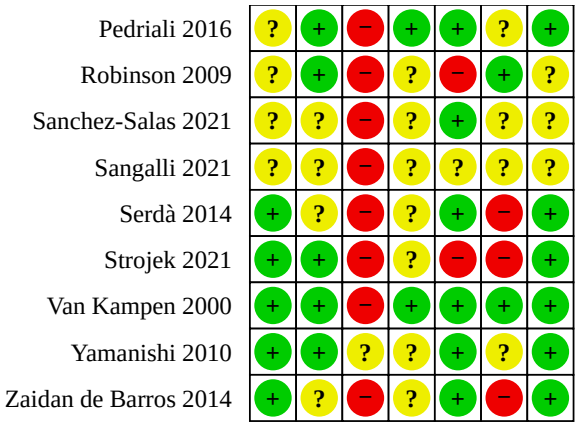


**Figure 3. (Continued)**




### Allocation

#### *Random sequence generation*

One study was judged to be at high risk of random sequence generation as it appeared to be quasi-randomised (Chen 2013). Eleven studies did not adequately report the method of randomisation; these were judged to be at an unclear risk for random sequence generation (Bennett 1996; Ceresoli 2002; Filocamo 2005; Franke 2000; Gomes 2018; Kakihara 2007; Morihiro 2011; Pedriali 2016; Robinson 2009; Sanchez-Salas 2021; Sangalli 2021). Thirteen studies were at low risk of bias for this domain (Ahmed 2012; Glazener 2011a; Glazener 2011b; Goode 2011; Laurienzo 2018; Manassero 2007; Moore 1999a; Moore 2008; Serdà 2014; Strojek 2021; Van Kampen 2000; Yamanishi 2010; Zaidan de Barros 2014).

#### *Allocation concealment*

Eleven studies did not adequately report the method of randomisation; these were judged to be at an unclear risk for allocation concealment (Bennett 1996; Ceresoli 2002; Chen 2013; Filocamo 2005; Franke 2000; Kakihara 2007; Manassero 2007; Morihiro 2011; Sanchez-Salas 2021; Sangalli 2021; Serdà 2014). Glazener 2011a, Glazener 2011b and Zaidan de Barros 2014 were judged to be at an unclear risk for this domain because their descriptions of allocation methods were unclear. Eleven studies were at low risk of bias for this domain (Ahmed 2012; Gomes 2018; Goode 2011; Laurienzo 2018; Moore 1999a; Moore 2008; Pedriali 2016; Robinson 2009; Strojek 2021; Van Kampen 2000; Yamanishi 2010).

### Blinding

#### *Blinding of participants and personnel (performance bias)*

Due to the nature of the interventions and comparisons being assessed within the studies, it would often have been impossible to blind participants to the nature of the treatment they were receiving. For this reason, 23 studies were rated as high risk of performance bias (Ahmed 2012; Ceresoli 2002; Chen 2013; Filocamo 2005; Franke 2000; Glazener 2011a; Glazener 2011b; Gomes 2018; Goode 2011; Kakihara 2007; Laurienzo 2018; Manassero 2007; Moore 1999a; Moore 2008; Morihiro 2011; Pedriali 2016; Robinson 2009; Sanchez-Salas 2021; Sangalli 2021; Serdà 2014; Strojek 2021; Van Kampen 2000; Zaidan de Barros 2014). Yamanishi 2010 was assessed as being at unclear risk because the study states that it is double-blind but does not report who specifically was blinded. One study was judged to be at a low risk of bias as blinding methods were adequate, or comparators were sufficient to ensure blinding between groups (Bennett 1996).

#### *Blinding of outcome assessor (detection bias)*

As blinding of outcome assessor was not reported, 14 studies were judged to be at an unclear risk of bias for this domain (Ahmed 2012; Bennett 1996; Ceresoli 2002; Chen 2013; Filocamo 2005; Franke 2000; Kakihara 2007; Moore 1999a; Morihiro 2011; Robinson 2009; Sanchez-Salas 2021; Sangalli 2021; Serdà 2014; Strojek 2021). Yamanishi 2010 was assessed as being at unclear risk because the study states that it is double-blind but does not report who specifically was blinded. Zaidan de Barros 2014 was also judged to be at unclear risk of detection bias as there were conflicting reports about whether the person undertaking data collection and analysis was blinded. Nine studies were judged to be at low risk of detection bias (Glazener 2011a; Glazener 2011b; Gomes 2018; Goode 2011; Laurienzo 2018; Manassero 2007; Moore 2008; Pedriali 2016; Van Kampen 2000).

### Incomplete outcome data

Seven studies were judged to be at high risk of attrition bias (Franke 2000; Goode 2011; Kakihara 2007; Manassero 2007; Moore 2008; Robinson 2009; Strojek 2021). Franke 2000 did not provide a study flow diagram or reasons for dropouts; the number of participants initially randomised to each arm was not clear and overall attrition was high. In Goode 2011, the overall attrition rate was greater than 20% and there was differential loss to follow-up between arms. In Kakihara 2007, there was a 20% loss to follow-up in the intervention arm; this loss was differential to the control arm, where there were no dropouts. There was also differential loss to follow-up between arms in Manassero 2007, Moore 2008 and Strojek 2021. In Robinson 2009, data were only reported for a limited number of the original participants across the outcomes.

The level of attrition and impact that this may have had on the results was unclear or not reported in four studies (Bennett 1996; Ceresoli 2002; Morihiro 2011; Sangalli 2021). Attrition bias was deemed to be low risk in 14 studies (Ahmed 2012; Chen 2013; Filocamo 2005; Glazener 2011a; Glazener 2011b; Gomes 2018; Laurienzo 2018; Moore 1999a; Pedriali 2016; Sanchez-Salas 2021;

Serdà 2014; Van Kampen 2000; Yamanishi 2010; Zaidan de Barros 2014).

### Selective reporting

Fourteen studies were judged to be at high risk of selective reporting (Ahmed 2012; Bennett 1996; Ceresoli 2002; Chen 2013; Filocamo 2005; Kakihara 2007; Laurienzo 2018; Manassero 2007; Moore 1999a; Moore 2008; Morihiro 2011; Serdà 2014; Strojek 2021; Zaidan de Barros 2014). Ahmed 2012 was retrospectively registered and the primary and secondary outcomes were different in the report and trial registration, with other discrepancies between the two also noted. In Bennett 1996, only partial interim results were reported and results were not presented for the individual groups. Ceresoli 2002 mentioned using a visual analogue scale (VAS) and 24-hour pad test in their methods, but these did not appear to be reported in the results. They also reported on nocturnal continence in the results but this was not mentioned in the methods. Filocamo 2005 did not provide results of the one-hour or 24-hour pad tests, although these were stated in the methods. Participants in Kakihara 2007 were "discharged" from the study if they were dry; the data from these participants were not included in the report. The trial registration of Laurienzo 2018 did not contain information on quality of life and there was no explanation for this deviation from protocol in the text. Outcome data were not presented for several outcomes in Manassero 2007. In Moore 1999a, full data were only presented for the 24-hour pad test. Full data were only presented for a single outcome in Moore 2008, with mean and median scores only reported for specific time points for the remaining outcomes. Morihiro 2011 was not registered in a public clinical trials registry and fewer time points were reported in the results than were stated in the methods. Serdà 2014 did not report on two pre-stated outcomes. Strojek 2021 did not appear to be prospectively or retrospectively registered, so it was not possible to tell whether outcomes were predefined. Zaidan de Barros 2014 was prospectively registered, but only urinary incontinence was stated as an outcome measure, whereas pelvic floor muscle (PFM) strength was also reported in an abstract. Additionally, there was a lack of an objective outcome measure reported in two studies (Chen 2013; Strojek 2021).

Seven studies were at an unclear risk of selective reporting (Glazener 2011a; Glazener 2011b; Goode 2011; Pedriali 2016; Sanchez-Salas 2021; Sangalli 2021; Yamanishi 2010). Although Glazener 2011a and Glazener 2011b were prospectively registered, duration of incontinence based on time of resolution was reported in the protocol, but not in the main text; it is also not listed as a change from protocol in the main report. Goode 2011 was also prospectively registered but only the primary outcomes are listed in the trial registration; there is no explanation for why additional analyses were undertaken. Pedriali 2016 was prospectively registered, but there were inconsistencies in reporting between the full text and trial registration. In Sanchez-Salas 2021, erectile dysfunction was reported, but this outcome was not mentioned in the trial registration. Sangalli 2021 did not report an associated trial registration, so it was not possible to tell whether the reported outcomes were pre-planned. Yamanishi 2010 did not mention a trial registration, so it was not possible to assess whether there were deviations from protocol.

Four studies were at low risk of selective reporting bias (Franke 2000; Gomes 2018; Robinson 2009; Van Kampen 2000).

### Other potential sources of bias

In three studies, the risk of other bias was assessed as high (Filocamo 2005; Manassero 2007; Moore 1999a). In Filocamo 2005, details on baseline factors, excluded participants and any adjuvant therapies were not provided. At baseline, the participants in the control group of Manassero 2007 had less incontinence than the treatment group and the baseline measures suggested a potential issue with randomisation. Although the study authors of Moore 1999a explained the amount of urine loss across groups, many of the participants already had lower urinary tract symptoms (LUTS) before the study began and this may potentially have impacted the results.

Glazener 2011a was judged to be at an unclear risk of bias as men who had previously undergone transurethral resection of the prostate (TURP), but were found to have incidental prostate cancer were eligible to be randomised for the radical prostatectomy trial. It was unclear what effect this would have had on the overall results. In Goode 2011, more men had previously undergone previous pelvic floor muscle training (PFMT) in one group, and we were unclear what impact this may have had on the overall study results. For this reason, we assessed Goode 2011 to be at an unclear risk of other bias. Moore 2008 was also judged to be at an unclear risk of other bias, as not enough detail about baseline characteristics were provided to make a judgement.

Not enough information was presented to be able to make a judgement about this domain in six studies, leading to an assessment of unclear risk of bias (Bennett 1996; Ceresoli 2002; Morihiro 2011; Robinson 2009; Sanchez-Salas 2021; Sangalli 2021). Franke 2000 was assessed as being at an unclear risk of other bias as only age at baseline was reported, with no other baseline information available. Similarly, Kakihara 2007 was also judged to be at an unclear risk of other bias because very few baseline characteristics were presented and data were not normally distributed, suggesting a potential issue in randomisation.

Nine studies were at a low risk of bias for this domain (Ahmed 2012; Chen 2013; Glazener 2011b; Gomes 2018; Laurienzo 2018; Pedriali 2016; Serdà 2014; Strojek 2021; Van Kampen 2000; Yamanishi 2010; Zaidan de Barros 2014).

## Effects of interventions

See: **Summary of findings 1** Pelvic floor muscle training (PFMT) plus biofeedback versus no treatment, sham treatment or verbal/ written instruction; **Summary of findings 2** Electrical or magnetic stimulation versus no treatment, sham treatment or verbal/written instruction; **Summary of findings 3** Combinations of conservative treatments versus no treatment, sham treatment or verbal/written instruction

### PFMT versus no treatment, sham treatment or verbal/ written instructions

Seven studies contributed to this comparison (Filocamo 2005; Laurienzo 2018; Manassero 2007; Moore 1999a; Robinson 2009; Serdà 2014; Strojek 2021). The data from Robinson 2009 were not usable as numbers in each group were not reported. The data from Serdà 2014 were not usable as the study authors did not disaggregate data between those who had previously had radiotherapy and those who had surgery.

### *Primary outcomes*

#### Subjective cure or improvement of urinary incontinence

It was not possible to pool data from the two studies that reported subjective cure or improvement of UI at three to six months. The studies reported inconsistent effects of PFMT on subjective cure or improvement of UI compared to control, suggesting both potential benefit and no difference between groups (Analysis 1.1).

One study reported on subjective cure or improvement of UI between 6 and 12 months, suggesting that more men undertaking PFMT may be completely dry or only have occasional leakage compared to control (Analysis 1.2).

#### Condition-specific quality of life

Three studies reported on condition-specific quality of life between three and six months but could not be pooled. The studies reported inconsistent results on the effect of PFMT compared to control, suggesting slight improvement, no difference and a negative effect on quality of life for men undertaking PFMT (Analysis 1.3). No study reported usable data on condition-specific quality of life between 6 and 12 months.

### *Secondary outcomes*

#### Objective cure or improvement of urinary incontinence

Between three and six months, PFMT alone may lead to more men experiencing objective cure or improvement of urinary incontinence compared with control (risk ratio (RR) 1.50, 95% confidence interval (CI) 1.33 to 1.69; 2 studies; n = 394; Analysis 1.4; in absolute terms: 595 per 1000 for control arm and 892 per 1000 for intervention arm). The sensitivity analysis removing studies where UI was not a clear inclusion criteria suggested that there may be a slightly stronger result in favour of PFMT, but there was greater imprecision in the 95% CI (RR 1.71, 95% CI 1.13 to 2.61; in absolute terms: 400 per 1000 for control group and 684 per 1000 for intervention arm; Table 2). Two studies reported data between three and six months that could not be pooled; the results of these studies were inconsistent, suggesting either no difference or greater leakage for men undertaking PFMT (Analysis 1.5).

Between 6 and 12 months, it is uncertain whether undertaking PFMT alone sustains a greater objective cure or improvement of urinary incontinence compared with control as the 95% CI suggests the possibility of both benefit and harm (RR 1.40, 95% CI 0.80 to 2.44; 2 studies; n = 394; Analysis 1.6; in absolute terms: 784 per 1000 for control group and 1000 per 1000 for intervention arm). The sensitivity analysis removing studies where UI was not a clear inclusion criteria suggested that there may be a slightly stronger result in favour of PFMT but there was still imprecision in the 95% CI (RR 1.79, 95% CI 1.27 to 2.53; in absolute terms: 475 per 1000 for control group and 850 per 1000 for intervention arm; Table 2).

#### Participant adherence to the intervention

Not reported.

#### General quality of life

Not reported.

#### Number of participants experiencing surface or skin-related adverse events

Not reported.

#### Number of participants experiencing muscle-related adverse events

Not reported.

#### Number of participants experiencing adverse events relating to the viscera or anorectum

One study reported that two men complained of rectal pain during PFMT exercises and no adverse events in the control group (Analysis 1.7).

## PFMT plus biofeedback versus no treatment, sham treatment or verbal/ written instructions

Four studies contributed to this comparison (Moore 2008; Robinson 2009; Sanchez-Salas 2021; Van Kampen 2000). The data from Robinson 2009 and some from Moore 2008 were not usable as numbers in each group were not reported.

### *Primary outcomes*

#### Subjective cure or improvement of urinary incontinence

One study reported on subjective cure or improvement of urinary incontinence at six months, suggesting there may be little difference between PFMT and biofeedback compared with control (Analysis 2.1).

One study reported on subjective cure or improvement of urinary incontinence between 6 and 12 months, suggesting that 10% more men in the PFMT and biofeedback group may be cured compared to control (Analysis 2.2; Summary of findings 1; low-certainty evidence).

#### Condition-specific quality of life

Not reported.

### *Secondary outcomes*

#### Objective cure or improvement of urinary incontinence

Three studies reported on objective cure or improvement of urinary incontinence between three and six months but could not be pooled. The results of these studies were inconsistent, suggesting both benefit and harm (Analysis 2.3).

Two studies reported on objective cure or improvement of urinary incontinence between 6 and 12 months but could not be pooled. The results of both studies suggested men undertaking PFMT may leak more on average than those in the control group, though one study also suggested that men undertaking PFMT may be more likely to be continent (Analysis 2.4; Summary of findings 1; low-certainty evidence).

#### Participant adherence to the intervention

Not reported.

#### General quality of life

Not reported.

#### Number of participants experiencing surface or skin-related adverse events

It is uncertain whether there is any difference in the number of men experiencing surface or skin-related adverse events between those undertaking PFMT plus biofeedback and those in the control group

(1 study; n = 205; Analysis 2.5; Summary of findings 1; very low-certainty evidence).

#### Number of participants experiencing muscle-related adverse events

It is uncertain whether there is any difference in the number of men experiencing muscle-related adverse events between those undertaking PFMT plus biofeedback and those in the control group (1 study; n = 205; Analysis 2.6; Summary of findings 1; very low-certainty evidence).

#### Number of participants experiencing adverse events relating to the viscera or anorectum

One study reported that no adverse events were experienced by both men undertaking PFMT plus biofeedback and men in the control group (Analysis 2.7).

### Electrical or magnetic stimulation versus no treatment, sham treatment or verbal/ written instructions

One study contributed to this comparison (Ahmed 2012). The study did not report on any of our pre-specified outcomes for the summary of findings table (Summary of findings 2).

#### *Primary outcomes*

#### Subjective cure or improvement of urinary incontinence

Not reported.

#### Condition-specific quality of life

At 24 weeks, one study suggested there may be little difference between men undertaking electrical stimulation and those with verbal and written instructions in terms of condition-specific quality of life (Analysis 3.1). Condition-specific quality of life between 6 and 12 months was not reported.

#### *Secondary outcomes*

#### Objective cure or improvement of urinary incontinence

At 24 weeks, one study reported that men undertaking electrical stimulation may experience less leakage than those in the control group (Analysis 3.2). Objective cure or improvement of urinary incontinence between 6 and 12 months was not reported.

#### Participant adherence to the intervention

Not reported.

#### General quality of life

Not reported.

#### Number of participants experiencing surface or skin-related adverse events

Not reported.

#### Number of participants experiencing muscle-related adverse events

Not reported.

#### Number of participants experiencing adverse events relating to the viscera or anorectum

Not reported.

### Lifestyle interventions versus no treatment, sham treatment or verbal/ written instructions

Two studies contributed to this comparison (Gomes 2018; Pedriali 2016).

#### *Primary outcomes*

#### Subjective cure or improvement of urinary incontinence

Not reported.

#### Condition-specific quality of life

Between three and six months, lifestyle interventions may result in an improvement in condition-specific quality of life measured on the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) (mean difference (MD) -3.66, 95% CI -5.26 to -2.06; 2 studies; n = 126; Analysis 4.1). Another study that could not be pooled also reported that men undertaking lifestyle interventions may experience improved condition-specific quality of life compared to control (Analysis 4.2).

Condition-specific quality of life between 6 and 12 months was not reported.

#### *Secondary outcomes*

#### Objective cure or improvement of urinary incontinence

When measured dichotomously, between three and six months lifestyle interventions may result in an improvement in urinary incontinence when measured objectively (RR 2.28, 95% CI 1.38 to 3.79; 2 studies; n = 126; Analysis 4.3; in absolute terms: 227 per 1000 in control group and 518 per 1000 in intervention group). However, analysis of mean weight on 24 hour pad test suggests that men undertaking lifestyle interventions may leak more than those in the controls groups at three to six months (MD 17.29, 95% CI 6.69 to 27.90; 2 studies; n = 126; Analysis 4.4).

Objective cure or improvement in UI between 6 and 12 months was not reported.

#### Participant adherence to the intervention

Not reported.

#### General quality of life

Not reported.

#### Number of participants experiencing surface or skin-related adverse events

Not reported.

#### Number of participants experiencing muscle-related adverse events

Not reported.

#### Number of participants experiencing adverse events relating to the viscera or anorectum

Not reported.

### Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions

Eleven studies contributed to this comparison (Ahmed 2012; Bennett 1996; Chen 2013; Franke 2000; Glazener 2011a; Glazener

2011b; Gomes 2018; Goode 2011; Laurienzo 2018; Moore 1999a; Pedriali 2016).

### *Primary outcomes*

#### Subjective cure or improvement of urinary incontinence

Between three and six months, it is uncertain whether combinations of conservative treatments results in slightly greater subjective cure or improvement of UI compared with control, as the 95% CI suggests the possibility of both benefit and harm (RR 0.88, 95% CI 0.48 to 1.60; 3 studies; n = 747; Analysis 5.1; in absolute terms: 355 per 1000 for control group and 312 per 1000 for intervention group). One study reporting at six months could not be pooled but suggested a slight improvement in incontinence for those undertaking combinations of treatments compared to control (Analysis 5.2).

Between 6 and 12 months, there may be little difference in subjective cure or improvement of incontinence between those who undertook combinations of treatments and those in the control group (RR 0.97, 95% CI 0.79 to 1.19; 2 studies; n = 788; Analysis 5.3; Summary of findings 3; low-certainty evidence; in absolute terms: 307 per 1000 for control group and 297 per 1000 for intervention group).

#### Condition-specific quality of life

Between three and six months, dichotomous data suggested that men undertaking combinations of conservative treatments may experience greater improvement in quality of life compared with control (RR 2.96, 95% CI 1.15 to 7.61; 2 studies; n = 99; Analysis 5.4; in absolute terms: 96 per 1000 for control arm and 285 per 1000 for intervention arm). However, when measured continuously there may be little evidence of a difference between intervention and control, though the 95% CI also suggests the possibility of a small effect in favour of combined treatments (standardised mean difference (SMD) -0.22, 95% CI -0.44 to 0.01; 5 studies; n = 977; Analysis 5.5). In the sensitivity analysis removing studies where UI was not a clear inclusion criteria, the result was robust and there was no real difference in the effect estimate or 95% CI (SMD -0.2, 95% CI -0.45 to 0.05; Table 2). One study that could not be pooled into either analysis also suggested there may be little difference in condition-specific quality of life between combinations of conservative interventions and control (Analysis 5.6).

Between 6 and 12 months, there is probably little difference in condition-specific quality of life between combinations of treatments and control, as measured by the ICIQ-Q (MD -0.28, 95% CI -0.86 to 0.29; 2 studies; n = 788; Analysis 5.7; Summary of findings 3; moderate-certainty evidence).

### *Secondary outcomes*

#### Objective cure or improvement of urinary incontinence

Between three and six months, when measured dichotomously, men undertaking combinations of treatments may experience greater objective cure or improvement of incontinence compared with control (RR 1.55, 95% CI 1.20 to 2.00; 3 studies; n = 183; Analysis 5.8; absolute terms: 348 per 1000 for control group and 539 per 1000 for intervention group). The sensitivity analysis removing studies where UI was not a clear inclusion criteria suggested that there may be a slightly stronger result in favour of combinations of conservative treatments but there was greater imprecision in the 95% CI (RR 1.83, 95% CI 1.07 to 3.12; in absolute terms: 227 per 1000 for control group and 416 per 1000 for intervention arm; Table 2).

However, when measured continuously, there may be little difference in overall leakage between the two groups, though the 95% CI also suggests the possibility of a small effect in favour of combined treatments (SMD -0.21, 95% CI -0.47 to 0.05; 6 studies; n = 815; Analysis 5.9). In the sensitivity analysis removing studies where UI was not a clear inclusion criteria, there was a marginally weaker effect from combinations of conservative treatments but no major difference in results (SMD -0.12, 95% CI -0.35 to 0.11; Table 2). Two studies that could not be pooled into either analysis reported inconsistent effects, suggesting either little difference between groups or a reduction in leakage for those undertaking combined interventions (Analysis 5.10).

Between 6 and 12 months, there is no difference in the frequency of UI from diaries between groups (MD 0.18, 95% CI -0.24 to 0.60; 2 studies; n = 565; Analysis 5.11; Summary of findings 3; high-certainty evidence).

#### Participant adherence to the intervention

At three to six months and measured dichotomously, men undertaking combinations of conservative treatments may be more adherent to the intervention than those in control (RR 1.54, 95% CI 1.22 to 1.93; 2 studies; n = 781; Analysis 5.12; absolute terms: 209 per 1000 for control group and 322 per 1000 for intervention group). However, when measured on a continuous scale it is uncertain whether men undertaking combinations of treatments slightly increase the average number of contractions they undertake, as the 95% CI suggests both a reduction and increase in contractions (MD 3.91, 95% CI -8.40 to 16.21; 2 studies; n = 755; Analysis 5.13).

Between 6 and 12 months, it is uncertain whether there is an increased adherence to the intervention for those undergoing combinations of treatments compared with control (RR 2.08, 95% CI 0.78 to 5.56; 2 studies; n = 763; Analysis 5.14; Summary of findings 3; very low-certainty evidence; absolute terms: 172 per 1000 for control group and 358 per 1000 for intervention group). When measured on a continuous scale it is similarly uncertain whether there is a difference in adherence between groups, as the 95% CI suggests both a reduction and increase in average number of contractions undertaken (MD 0.79, 95% CI -13.66 to 15.25; 2 studies; n = 762; Analysis 5.15).

#### General quality of life

Between three and six months, there may be no difference in general quality of life between men undertaking combinations of conservative treatments and those in the control group (MD -0.01, 95% CI -0.04 to 0.03; 2 studies; n = 746; Analysis 5.16).

Between 6 and 12 months, there is probably no difference between groups in general quality of life measured by the EQ-5D (MD -0.01, 95% CI -0.04 to 0.03; 2 studies; n = 742; Analysis 5.17; Summary of findings 3; moderate-certainty evidence).

#### Number of participants experiencing surface or skin-related adverse events

Based on two studies, there is probably no difference in adverse events between groups (Analysis 5.18; Summary of findings 3;

moderate-certainty evidence). Both studies reported no adverse events in either group.

#### Number of participants experiencing muscle-related adverse events

It is uncertain whether men undertaking combinations of treatments experience more muscle-related adverse events compared to control (RR 2.92, 95% CI 0.31 to 27.41; 2 studies; n = 136; Analysis 5.19; Summary of findings 3; very low-certainty evidence; in absolute terms: 0 per 1000 for both groups). Two other studies were unable to be pooled into this analysis, as they reported zero events in each arm (Analysis 5.20).

#### Number of participants experiencing adverse events relating to the viscera or anorectum

Four studies reported on adverse events relating to the viscera or anorectum but were not able to be pooled. Three studies reported no adverse events in either the combinations or control groups, while one study reported no events in the control or PFMT plus bladder training plus fluid management groups, though two participants in the PFMT plus bladder training plus fluid management plus biofeedback plus electrical stimulation group reported haemorrhoidal irritation (Analysis 5.21).

### PFMT plus electrical stimulation versus PFMT alone

Eight studies contributed to this comparison (Ceresoli 2002; Kakihara 2007; Laurienzo 2018; Moore 1999a; Morihiro 2011; Sangalli 2021; Yamanishi 2010; Zaidan de Barros 2014). Data from one study could not be used in analyses (Sangalli 2021).

#### *Primary outcomes*

#### Subjective cure or improvement of urinary incontinence

Between three and six months, PFMT plus electrical stimulation may lead more men experiencing subjective improvement in urinary incontinence compared to PFMT alone (RR 1.46, 95% CI 0.96 to 2.23; 3 studies; n = 139; Analysis 6.1; absolute terms: 571 per 1000 for control group and 834 per 1000 for intervention group). The sensitivity analysis removing studies where UI was not a clear inclusion criteria suggested that there may be a slightly stronger result in favour of PFMT plus electrical stimulation but there was greater imprecision in the 95% CI (RR 2.67, 95% CI 1.15 to 6.17; in absolute terms: 250 per 1000 for control group and 668 per 1000 for intervention arm; Table 2). Two studies could not be pooled into the analysis, with both suggesting a greater improvement in subjective urinary incontinence for those undertaking PFMT and electrical stimulation (Analysis 6.2).

Between 6 and 12 months, the effects of PFMT plus electrical stimulation compared to PFMT alone are uncertain as the 95% CI for the pooled analysis is suggestive of both moderate benefit and harm (SMD -0.06, 95% CI -0.56 to 0.43; 2 studies; n = 65; Analysis 6.3). The sensitivity analysis removing studies at high risk of bias suggested that there may be a slightly stronger result in favour of PFMT plus electrical stimulation but there was greater imprecision in the 95% CI (SMD -0.22, 95% CI -0.79 to 0.36; Table 3). One study could not be pooled into this analysis but suggested that men undertaking PFMT and electrical stimulation may be more likely to be continent at 12 months compared to men undertaking PFMT alone (Analysis 6.4).

#### Condition-specific quality of life

Three studies reported on condition-specific quality of life between three and six months but were not able to be pooled. The results between studies were inconsistent. Two studies suggested there may be an improvement in condition-specific quality of life for men undergoing PFMT and electrical stimulation together, while the remaining study suggested there may be little difference between groups (Analysis 6.5).

Between 6 and 12 months, the effects of PFMT and electrical stimulation on condition-specific quality of life compared to PFMT alone are uncertain because the 95% CI suggests both moderate benefit and harm (SMD 0.05, 95% CI -0.51 to 0.62; 2 studies; n = 65; Analysis 6.6). The sensitivity analysis removing studies at high risk of bias suggested that there may be a slightly stronger result in favour of PFMT plus electrical stimulation but there was greater imprecision in the 95% CI (SMD -0.14, 95% CI -0.71 to 0.43; Table 3). One study assessing condition-specific quality of life at 12 months could not be pooled into the analysis but suggested that men in groups may experience a decrease on every domain of the KHQ except for personal relationships (Analysis 6.7).

#### *Secondary outcomes*

#### Objective cure or improvement of urinary incontinence

The effects of PFMT and electrical stimulation on objective cure or improvement in urinary incontinence compared to PFMT alone between three and six months is uncertain because the 95% CI suggests both a decrease and increase in leakage (MD -35.69, 95% CI (-172.93; 101.54; 2 studies; n = 86; Analysis 6.8). The sensitivity analysis removing studies at high risk of bias suggested that there may be a slightly stronger result in favour of PFMT plus electrical stimulation but there was greater imprecision in the 95% CI (MD -112.30, 95% CI -226.70 to 2.10; Table 3). Three studies reported data on objective cure or improvement in urinary incontinence between three and six months but could not be pooled. The results of these studies were inconsistent. Two studies suggested there may be little evidence of a difference between groups, while the remaining study suggested that men undertaking PFMT and electrical stimulation may be more likely to be objectively continent compared to those undertaking PFMT alone (Analysis 6.9).

The effects of PFMT and electrical stimulation on objective cure or improvement in urinary incontinence compared to PFMT alone between 6 and 12 months is also uncertain because the 95% CI suggests both a moderate decrease or small increase in leakage (SMD 0.06, 95% CI -0.94 to 1.07; 2 studies; n = 65; Analysis 6.10). The sensitivity analysis removing studies at high risk of bias suggested that there may be a slightly stronger result in favour of PFMT plus electrical stimulation but there was greater imprecision in the 95% CI (SMD -0.38, 95% CI -0.96 to 0.20; Table 3).One other study could not be pooled but suggested that slightly more men undertaking PFMT and electrical stimulation may be continent at 12 months compared to PFMT alone (Analysis 6.11).

#### Participant adherence to the intervention

Not reported.

#### General quality of life

Not reported.

#### Number of participants experiencing surface or skin-related adverse events

One study reported that there were no remarkable adverse events experienced either by men performing PFMT and electrical stimulation and those doing PFMT alone (Analysis 6.12).

#### Number of participants experiencing muscle-related adverse events

Two studies reported on muscle-related adverse events but could not be pooled. The results between the studies were inconsistent, with one study reported that there were no remarkable adverse events experienced by either groups and the other study suggesting slightly fewer men undergoing PFMT and electrical stimulation may report discomfort or anal pain compared to those undertaking PFMT and sham stimulation (Analysis 6.13).

#### Number of participants experiencing adverse events relating to the viscera or anorectum

It is unclear whether there is any evidence of a difference between PFMT and electrical stimulation and PFMT alone in terms of adverse events relating to the viscera or anorectum because the 95% CI is wide and suggests both benefit and harm (RR 1.04, 95% CI 0.04 to 29.33; 2 studies; n = 93; Analysis 6.14; absolute terms: 42 per 1000 for control group and 43 per 1000 for intervention group). The sensitivity analysis removing studies at high risk of bias suggested that there may be a slightly stronger result in favour of PFMT plus electrical stimulation but there was greater imprecision in the 95% CI (RR 5.74, 95% CI 0.29 to 114.41; in absolute terms: 0 per 1000 for control group and 0 per 1000 for intervention arm; Table 3).One study that could not be pooled reported zero events in both arms (Analysis 6.15).

# DISCUSSION

## Summary of main results

We identified 25 studies including a total of 3079 participants.

Four studies reported on pelvic floor muscle training (PFMT) plus biofeedback versus no treatment, sham treatment and/or verbal or written instructions. PFMT plus biofeedback may result in greater subjective cure of incontinence from 6 to 12 months (low-certainty evidence; Summary of findings 1). However, men undertaking PFMT and biofeedback may be less likely to be objectively cured at from 6 to 12 months (low-certainty evidence; Summary of findings 1). It is uncertain whether undertaking PFMT and biofeedback has an effect on surface or skin-related adverse events (very low-certainty evidence; Summary of findings 1) or muscle-related adverse events (very low-certainty evidence; Summary of findings 1). Condition-specific quality of life, participant adherence to the intervention and general quality of life were not reported by any study for this comparison.

Eleven studies assess combinations of conservative treatments versus no treatment, sham treatment and/or verbal or written instructions. Combinations of conservative treatments may lead to little difference in the number of men being subjectively cured or improved of incontinence between 6 and 12 months (low-certainty evidence; Summary of findings 3. Combinations of conservative treatments probably lead to little difference in condition-specific quality of life (moderate-certainty evidence; Summary of findings 3) and probably little difference in general quality of life between 6 and 12 months (moderate-certainty evidence; Summary of findings 3). There is little difference between combinations of conservative treatments and control in terms of objective cure or improvement of incontinence between 6 and 12 months (high-certainty evidence; Summary of findings 3). However, it is uncertain whether participant adherence to the intervention between 6 and 12 months is increased for those undertaking combinations of conservative treatments (very low-certainty evidence; Summary of findings 3). There is probably no difference between combinations and control in terms of the number of men experiencing surface or skin-related adverse events (moderate-certainty evidence; Summary of findings 3), but it is uncertain whether combinations of treatments lead to more men experiencing muscle-related adverse events (very low-certainty evidence; Summary of findings 3).

We did not identify any studies assessing electrical or magnetic stimulation versus no intervention, sham or verbal or written instructions that reported on our key outcomes of interest (Summary of findings 2).

## Overall completeness and applicability of evidence

We conducted a comprehensive search for studies, including both forward and backward citation chaining, and made every attempt to obtain unpublished data where necessary by contacting study authors. However, despite identifying 25 studies for the review, not all comparisons were well covered. Only one study contributed to the comparison between electrical or magnetic stimulation and control, while 11 studies assessed the effects of a combination of conservative interventions

Many of the studies were small, with the smallest having 25 participants and the largest 442 participants. The studies were conducted in a range of countries, including low- and middle-income countries, with the most studies being conducted in Brazil. However, 14 studies explicitly stated that the men had undergone radical surgery due to prostate cancer, while we ascertained that the likely cause of radical prostatectomy in nine studies was prostate cancer. Only one study included men who had previously undergone TURP. As such, we cannot be certain that our findings are generalisable to men who have previously undergone procedures other than radical prostatectomy.

A large amount of heterogeneity in how outcomes were reported across studies was present, leading to some outcomes having both dichotomous and continuous meta-analyses, as well as other data that could not be pooled.

## Quality of the evidence

In general, the evidence base identified for this review is mixed, ranging from very low-certainty to high certainty. One of our main reasons for downgrading using GRADE was imprecision of results, as most studies were small and had few participants.

We also downgraded evidence due to risk of bias. In general, most of the studies included in this review were at high risk of performance bias because the nature of the interventions often meant that it would have been impossible to blind the participants and the personnel to the treatments in each arm. Furthermore, over 50% of the studies we identified for this review were at high risk of selective reporting bias. Allocation concealment, the methods used to randomise participants and the blinding of the outcome assessment were also often unclear in many cases.

### Potential biases in the review process

We made every effort to reduce bias within the review process, including by conducting a comprehensive literature search and updating this during the review process to ensure maximum relevancy. In addition, two review authors independently screened studies, performed data extraction, risk of bias assessments and GRADE assessments to reduce bias in the process insofar as possible. We also contacted study authors to gain additional information and data, where possible.

However, we made changes to the protocol after it was published (see Differences between protocol and review), many of which were implemented after study selection and data extraction had begun. We have provided rationales for the changes and made every attempt not to be data-driven in our approach, instead making the changes in order to make the review more useful and accessible for key stakeholders. However, we recognise that changing aspects of the protocol post-publication may have introduced some elements of bias into the review process.

### Agreements and disagreements with other studies or reviews

Strączyńska 2019 included eight studies and 1079 men, assessing the effects of preoperative and postoperative PFMT, home versus supervised PFMT, PFMT and resistance training versus PFMT alone and unsupervised PFMT versus no treatment. The two studies identified by the review assessing unsupervised PFMT with no treatment were also identified by this review. Strączyńska 2019 concluded that in both these studies there were more beneficial results for the men undertaking PFMT. However, this review found that, when PFMT alone was compared to control, results for both subjective and objective cure or improvement of incontinence were mixed.

Kannan 2018 included 15 studies and also examined a range of comparisons. The review authors noted that a larger number of men undertaking PFMT were continent at follow-up compared to no treatment, based on meta-analyses of five studies. Again, review found that, when PFMT alone was compared to control, results for both subjective and objective cure or improvement of incontinence were mixed. Kannan 2018 also noted that a meta-analysis of two studies suggested a reduction in urine lost on the 24-hour pad test immediately following treatment for men undertaking PFMT and electrical stimulation compared to sham electrical stimulation. From a single study, more men undertaking a combination of PFMT, electrical stimulation and biofeedback were continent compared to those undergoing sham electrical stimulation. In this study, we found high-certainty evidence of little difference between men undergoing combinations of treatments compared with control in terms of objective cure or improvement of incontinence.

MacDonald 2007 identified 11 studies with 1028 men. In their review, they identified one trial of 300 men that suggested fewer men who had undertaken PFMT were using two or more pads daily at 12 months compared with no those who had not undergone training. PFMT. However, in this review we were unable to pool results for objective cure when PFMT alone was compared to control, but results of the narrative review were mixed. At three to four months after RP, a pooled analysis of five studies also suggested that more men undertaking PFMT and biofeedback were continent compared with no intervention. However, when biofeedback-enhanced PFMT was compared to written or verbal PFMT instructions in three studies, MacDonald 2007 did not find a significant difference between treatments for any outcome. This finding correlates more closely with the findings of this review, as we only identified low or very low-certainty evidence for the comparison of PFMT plus biofeedback versus control between 6 and 12 months.

Finally, Zhu 2012 included four studies with 210 men comparing electrical stimulation and PFMT with PFMT alone in their meta-analysis. They concluded that, at both three months and 6 to 12 months after surgery, PFMT and electrical stimulation did not show any greater benefit to continence compared with PFMT alone. In this review, we could not be certain of the effects of PFMT plus electrical stimulation compared with PFMT alone for both subjective and objective cure or improvement of incontinence because the confidence intervals in our analyses were wide.

## AUTHORS' CONCLUSIONS

### Implications for practice

There is a lack of high-certainty evidence regarding the use of conservative interventions for urinary incontinence following prostate surgery. Existing trials lack standardisation regarding the PFMT technique, protocols for combining conservative treatments, outcome measures for assessing subjective and objective response as well as quality of life and the reporting of adverse events.

### Implications for research

There is need for adequately powered, robust clinical trials examining incontinence in men following prostate surgery using standardised and validated outcome measures to assess subjective response, objective response, and both condition-specific and general quality of life.

Protocols for PFMT, as well as its combination with other conservative treatments, need to be standardised to allow better comparison among studies. The development of a core outcome set surrounding post-prostatectomy urinary incontinence would also assist in standardising the outcome measures used within studies, particularly as this systematic review found considerable heterogeneity in how outcomes were measured between included studies.

Studies need to be conducted in men with incontinence following robot-assisted radical prostatectomy and prostate surgery for treating lower urinary tract symptoms secondary to benign prostatic obstruction, including transurethral resection of the prostate. This review found only a single eligible study in men who had previously undergone transurethral resection of the prostate and none in men who had previously undergone any other established technique of prostate surgery for treating lower urinary tract symptoms secondary to benign prostate obstruction.

The need for contemporary trials is also dictated by the profound impact of robot-assisted radical prostatectomy, which has been rapidly adopted globally. It is uncertain whether evidence generated from studies examining interventions for incontinence following open or laparoscopic prostate cancer surgery can be applied to men with incontinence following robot assisted radical prostatectomy.

## ACKNOWLEDGEMENTS

We would like to thank Sheila Wallace, Lindsey Elstub, Nicole O'Connor and Claire Eastaugh for their editorial support on this review.

We are grateful to the following people for assisting with translations for the review:

- Gabriela Azevedo Sansoni: Faculty of Medicine and Surgery, University of Milan
- Yuan Chi: Health Network, China; Cochrane Campbell Global Ageing Partnership, UK
- Elaine Martí
- Benjamin Hernández Wolters: Centro Universitario de Ciencias de la Salud, Universidad de Guadalajara, Guadalajara, Mexico
- Fangfang Zhao: Chinese Journal of Integrated Traditional and Western Medicine, China; Xiyuan Hospital, Chinese Academy of Chinese Medical Sciences, China

**Editorial and peer-reviewer contributions**

The following people conducted the editorial process for this article.

• Sign-off Editor (final editorial decision): Luke Vale, Cochrane's editorial board.

• Managing Editor (selected peer reviewers, collated peer-reviewer comments, provided editorial guidance to authors, edited the article): Samuel Hinsley, Central Editorial Service

• Editorial Assistant (conducted editorial policy checks and supported editorial team): Leticia Rodrigues, Central Editorial Service

• Copy Editor (copy editing and production): Heather Maxwell

• Peer-reviewers (provided comments and recommended an editorial decision): Dr. M.S. Rahnama'i st. Elisabeth - Tweesteden Hospital Tilburg - The Netherlands (clinical review), Akhil Das, MD FACS, University of California Irvine (clinical review), Brian Duncan (consumer review), Nuala Livingstone, Cochrane Evidence Production and Methods Directorate (methods review), Anne Littlewood, Cochrane Oral Health (search review). 1 of additional peer reviewers provided clinical peer review but chose not to be publicly acknowledged.

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* Indicates the major publication for the study

# CHARACTERISTICS OF STUDIES

## Characteristics of included studies *[ordered by study ID]*

### Ahmed 2012

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: multi-arm RCT<br><br>**Dates study conducted**: July 2007 to February 2010 |
| Participants | **Number of participants randomised**: 90<br><br>**Country**: Egypt<br><br>**Setting**: single centre (National Institute of Urology and Nephrology)<br><br>**Reason for undergoing prostate surgery**: clinically localised prostate cancer<br><br>**Type of prostate surgery undertaken**: RP<br><br>• No nerve sparing: Group I 35.71% (n = 28); Group II 34.62% (n = 26); Group III 30.77% (n = 26)<br>• Nerve sparing (unilateral and bilateral): Group I 64.29% (n = 28); Group II 65.38% (n = 26); Group III 69.23% (n = 26)<br><br>**Type of UI**: NR<br><br>**Participants' age**: Group I: 56.3 ± 6.8 (n = 28); Group II: 58.8 ± 5.4 (n = 26); Group III: 57.2 ± 3.25 (n = 26)<br><br>**Participants' BMI**: Group I: 33.9 ± 3.4 (n = 28); Group II: 35 ± 4.5 (n = 26); Group III: 32.8 ± 3.2 (n = 26) |

**Ahmed 2012** *(Continued)*

| | |
|---|---|
| | **Inclusion criteria**: underwent RP for clinically localised PCa at the centre<br><br>**Exclusion criteria**: previous urethral, bladder or prostate surgery; prior urinary or faecal incontinence; neurogenic psychiatric disorders; preoperative urinary tract complications; radiotherapy |
| Interventions | **Group I (n = 30): electrostimulation and biofeedback.** began one week after catheter removal and participants received treatment twice weekly for 12 weeks. Each of the 24 sessions was composed of a session of BFB (15 minutes) followed by 15 minutes of ES. For the BFB, a 2-channel electromyographic apparatus was used with a channel for the perineal, and other for abdominal muscles and the signal received through surface electrodes. In the right lateral decubitus position, participants practised 3 sets of 10 rapid contractions to improve phasic musculature. They then performed 3 sustained 5, 7 or 10 second contractions depending on their ability to maintain the contraction. Participants were then placed in the supine position, hips flexed to approximately 60 degrees, to perform 10 contractions during prolonged expiration (avoiding the Valsalva manoeuvre)<br><br>**Group II (n = 30): electrostimulation.** ES began one week after catheter removal. Treatment time was 15 minutes twice weekly for 12 consecutive weeks. The parameters were 50 Hz square wave with a 300 us pulse width, and output current of maximum tolerable intensity. Electrodes were placed symmetrically on the skin surface over 2nd through to 4th sacral outflow, where the lateral border of each of the electrodes were placed over the posterior iliac crest. The inside border was located one finger width from the midline.<br><br>**Group III (n = 30): control (usual instructions to perform PFMT).** Usual instruction on how to conduct PFMT, including verbal instruction by the physiotherapist and written examples of exercises (Kegel exercises) at the catheter removal visit and during follow-up visits. They received a booklet with these instructions and performed three sets of 15-20 contractions daily. Duration of each constriction was 3-5 seconds with a relaxation period of 6-10 seconds, initially practised in the supine position but later also when sitting, standing, squatting and going up and down stairs. After this, they were also encouraged to practice exercises before any effort that might induce UI |
| Outcomes | **Primary outcome**<br><br>• **Self-reported continence/ incontinence:** assessed using the 24-hour pad test; UI defined by guidelines of the ICS. Continence defined as no need for wearing a pad (0 pads)<br><br>**Secondary outcomes**<br><br>• **Quality of life:** measured using the incontinence impact questionnaire-7 (IIQ-7). Seven questions regarding the impact of UI, summarised to give a total score of 0 ("not at all") to 100 ("a great deal"). Modified Arabic version of the questionnaire used |
| Notes | **Conflicts of interest**: Quote: "Authors reported no conflicts of interest"<br><br>**Study funding sources**: NR<br><br>**ITT analysis**: NR but assumed PP<br><br>**Follow-up time points**: 6, 12 and 24 weeks<br><br>**Timing of assessment:** post-catheter removal. Quote: "The evaluation of PPI was performed one week after catheter removal (W0), at 6 (W6) and 12 (W12) weeks of intervention. Follow-up assessment has been performed 24 weeks (W24) after removing the catheter."<br><br>**Timing of randomisation**: unclear<br><br>**UI mentioned in inclusion criteria**: no |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|

**Ahmed 2012** *(Continued)*

| | | |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "The patients were randomized into one control group and two treatment groups, using a computer generated random-number list placed in sealed envelopes"<br><br>Comment: seems adequate |
| Allocation concealment (selection bias) | Low risk | Quote: "The patients were randomized into one control group and two treatment groups, using a computer generated random-number list placed in sealed envelopes"<br><br>Comment: seems adequate |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Quote: "One experienced physiotherapist delivered all therapy at the Physical Therapy Clinics at El-Materia Teaching Hospital, Cairo, Egypt"<br><br>Comment: only one member of personnel, so would not have been blinded to groups. Unlikely to be able to blind participants due to the nature of the interventions given in the study |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | Quote: "Data were available for 90 patients who were randomized into three groups. There were 10 patients who did not complete the trial because they could not attend the ambulatory schedule for various reasons. A total of 80 patients completed the trial, included 26 in the control group, 26 in the ES group and 28 in the ES+BFB group."<br><br>Comment: overall attrition not high or differential. Reasons for dropouts in groups explanted, including in flow diagram |
| Selective reporting (reporting bias) | High risk | Retrospectively registered. The primary outcome of the study is the secondary outcome in the trial registration. Urodynamic data were the primary outcome in the trial registration but says in full text: Quote:"Because urodynamic studies are invasive, they were avoided and used only in patients with UI after the 6-month follow-up according to ICS standards". Other than invasive nature of the test, unclear why changed. Quality of life not mentioned as an outcome in the trial registration but reported as secondary outcome in full report. Adherence data were recorded but not provided. |
| Other bias | Low risk | Nothing to suggest any other sources of bias. |

**Bennett 1996**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: NR |
| Participants | **Number of participants randomised**: 48<br><br>**Country**: USA<br><br>**Setting**: single centre<br><br>**Reason for undergoing prostate surgery**: prostate cancer |

**Bennett 1996** *(Continued)*

| | |
|---|---|
| | **Type of prostate surgery undertaken**: RP<br><br>**Type of UI**: SUI<br><br>**Participants' age**: total mean: 66.5 (range 52-76); n = 28<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: men who have SUI as a result of radical prostate surgery<br><br>**Exclusion criteria**: NR |
| Interventions | **Group I (n = NR): electrical stimulation and PFMT**. Participants give themselves 15-minute sessions of electrical stimulation every day, as well as performing pelvic floor muscle exercises. Elecrical stimulation was delivered using a Microgyn unit programmed to deliver 100 Hz for 4 seconds of stimulation, followed by a 4-second rest period.<br><br>**Group II (n = NR): sham electrical stimulation**. Participants will quote: "unknowingly" have "dummy" probes that do not give stimulation |
| Outcomes | • Cure or improvement of UI<br>• Leak point pressure<br>• Voiding intervals<br>• Incontinence episodes<br><br>Assessment tools not described |
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: American Foundation of Urologic Disease<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 3 and 6 months (unclear).<br><br>**Timing of assessment:** post-randomisation. Quote: "After the 3-month study period has been completed, the tests of the subjects' urinary functioning and pelvic muscle strength will be repeated, and the treatment and control groups will be compared"<br><br>**Timing of randomisation**: after catheter removal (for the 28 men analysed, they were at least 6 months following surgery)<br><br>**UI mentioned in inclusion criteria**: Yes<br><br>**Further notes:** only two protocol abstracts and an interim analysis in the form of an abstract available. No information or data provided for the two groups separately. We attempted to seek a full paper for the study but were unsuccessful. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "randomized"<br><br>Comment: unclear method of randomisation |
| Allocation concealment (selection bias) | Unclear risk | Not reported |

**Bennett 1996** *(Continued)*

| | | |
|---|---|---|
| Blinding of participants and personnel (performance bias)<br>All outcomes | Low risk | Quote: "double-blind"<br><br>Comment: although not fully described in the text, the fact that the participants in the control group had sham Estim suggests that they were probably adequately blinded. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Quote: "double-blind"<br><br>Comment: unclear whether this refers to participants and personnel or outcome assessor. |
| Incomplete outcome data (attrition bias)<br>All outcomes | Unclear risk | Quote: "Two patients withdrew from the study"<br><br>Comment: no other details given, unclear which group these belonged to. Further notes on the study provided within the abstract suggest that there were nine dropouts from the study overall, but no other detail given. |
| Selective reporting (reporting bias) | High risk | Interim analysis performed on 28/48 men enrolled; no results presented for the two groups individually. |
| Other bias | Unclear risk | Interim analysis; not enough information to be able to make a clear judgement. |

**Ceresoli 2002**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: NR |
| Participants | **Number of participants randomised**: 70<br><br>**Country**: Italy<br><br>**Setting**: NR<br><br>**Reason for undergoing prostate surgery**: localised PCa<br><br>**Type of prostate surgery undertaken**: radical perineal prostatectomy<br><br>**Type of UI**: NR<br><br>**Participants' age**: NR<br><br>**Participants' BMI**: BR<br><br>**Inclusion criteria**: patients who underwent radical perineal prostatectomy for localised prostatic cancer<br><br>**Exclusion criteria**: NR |
| Interventions | **Group I (n = 34): PFMT + transcutaneous electrical nerve stimulation.** Based on Kegel exercises. Electrical stimulation performed daily but no further information.<br><br>**Group II (n = 36): PFMT.** Based on Kegel exercises. |
| Outcomes | • **Continence:** Quote: "defined accordingly to Catalona's definition". Confirmed as a subjective measure of continence by the study authors |

**Ceresoli 2002** *(Continued)*

- **Severity of incontinence:** defined by the number of pads used daily, subjective VAS of improvement and 24-hour pad test

| | |
|---|---|
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: NR<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 1, 4 and 6 months<br><br>**Timing of assessment:** unclear. Notes "postoperatively" in assessment but unclear how long the intervention lasted<br><br>**Timing of randomisation**: after surgery, but exact time point not reported<br><br>**UI mentioned in inclusion criteria**: no<br><br>**Correspondence with study authors:** we contacted the study authors on 15 March 2022 to ask whether there were any subsequent publications to the abstract. The study authors confirmed that there were no further papers published on this study. Further communication with the study authors on 12 April 2022 confirmed that Catalona's definition of continence was a subjective measurement. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "randomized trial"<br><br>Comment: no other details |
| Allocation concealment (selection bias) | Unclear risk | Not reported |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Would have been impossible to blind participants as to whether they were in the PFMT or PFMT plus electrical stimulation group. Blinding of personnel not reported. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |
| Incomplete outcome data (attrition bias)<br>All outcomes | Unclear risk | Not reported |
| Selective reporting (reporting bias) | High risk | VAS scale and 24-hour pad test mentioned as measures in the methods but do not appear to be reported in the results. Additionally, nocturnal continence reported in the results but not stated as an outcome measure in the methods. |
| Other bias | Unclear risk | Abstract only - not enough information to be able to tell. |

**Chen 2013**

***Study characteristics***

| | |
|---|---|
| Methods | **Design:** quasi-RCT |

**Chen 2013** *(Continued)*

| | |
|---|---|
| | **Dates study conducted:** January 2009 to June 2012 |
| Participants | **Number of participants randomised**: 25<br><br>**Country**: China<br><br>**Setting**: single centre<br><br>**Reason for undergoing prostate surgery**: NR, but assumed PCa<br><br>**Type of prostate surgery undertaken**: laparoscopic RP<br><br>**Type of UI**: unclear<br><br>**Participants' age (years)**: Group I: 71 ± 5.8; Group II: 72 ± 5.75; Total: 72 ± 5.75 (range 65-82)<br><br>**Participants' BMI**: unclear<br><br>**Inclusion criteria**: patients with UI after laparoscopic RP; no medication used to treat UI after surgery; preoperative prostate surgery and radiotherapy not performed; no history of cerebrovascular accident<br><br>**Exclusion criteria**: NR |
| Interventions | **Group I (n = 13): rehabilitation (PFMT, urination reflex training, bladder function training, electrical stimulation, biofeedback).** Underwent routine nursing, systematic training and rehabilitation treatment. This was mainly PFMT, urination reflex training, bladder function training, pelvic floor electrical stimulation and biofeedback. PFMT was performed in supine, sitting or standing positions for training the lower limbs, abdominal and hip muscles to perform voluntary contractions of the pubic bone, perineum and anal sphincter. Urination reflex training was carried out 2 days before catheter extraction. The catheter was clamped and when the patient felt the inclination to urinate, they listened to the sound of running rather and imagined urinating into a clean toilet. Bladder function training included recording the time interval of daily drinking and urination, and delaying urination by 15 minutes until reaching 2.5- to 3-hour duration between urination. Electrical nerve stimulation was used after catheter removal to wake up damaged nerve fibres and increase the function of the detrusor muscles. The course of electrical stimulation lasted 4 weeks and the bladder was drained before treatment, which was performed once a day for 30 minutes. Biofeedback consisted of a probe being fitted into the anus and used to deliver electric currents of varying intensity to stimulate the pelvic floor muscles.<br><br>**Group II (n = 13): control (catheter clamping training).** Received conventional care (perineal care) before and after surgery. Two days before catheter extraction, they received catheter clamping training. |
| Outcomes | • **Duration of urinary incontinence:** cured was described as having a sense of urination being urinating and completely controlling the urination process. A significant effect was described as having basic control over urination, with occasional incontinence.<br>• **Effective rate of urinary incontinence treatment:** efficacy of treatment was described as feeling urination before urinating, occasionally controlled, but not consolidated. Ineffective described as having no significant improvement in UI symptoms, no change before and after comprehensive nursing. The total effective rate was determined according to the efficacy evaluation (cure rate + significant cure rate + effective rate) |
| Notes | **Conflicts of interest**: unclear<br><br>**Study funding sources**: Quote: "Scientific Research Foundation of Zhuhai Science and Technology Industry and Trade Bureau, No.2012D0401990028"<br><br>**ITT analysis**: unclear, but the number of participants randomised and the number analysed were the same<br><br>**Follow-up time points**: 1-3 months, 4-6 months, 7-9 months and 10-12 months<br><br>**Timing of assessment:** unclear |

**Chen 2013** *(Continued)*

**Timing of randomisation**: unclear

**UI mentioned in inclusion criteria**: yes (Quote: "All were patients with urinary incontinence after laparoscopic radical prostatectomy" according to translation)

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | High risk | Quote within translation: "Patients were randomly assigned according to the order of admission"<br><br>Comment: this suggests quasi-randomisation |
| Allocation concealment (selection bias) | Unclear risk | Translation indicates that method of allocation was not reported. |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Translation indicates that blinding was not mentioned. However, due to the nature of the interventions it would have been impossible for the groups to not be aware of which group they had been assigned to. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Translation indicates that blinding of outcome measurement was not reported. |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | Translation states that the numbers randomised to the groups and the numbers analysed were the same, either suggesting no dropouts overall or ITT analyses performed. |
| Selective reporting (reporting bias) | High risk | Outcomes stated in the methods appeared to be reported but lack of an objective outcome measure. |
| Other bias | Low risk | Nothing to suggest any other sources of bias. |

**Filocamo 2005**

***Study characteristics***

| | |
|---|---|
| Methods | **Study design:** RCT<br><br>**Dates study conducted:** January 2000 to January 2004 |
| Participants | **Number of participants randomised:** 300<br><br>**Country**: Italy<br><br>**Setting**: NR<br><br>**Reason for undergoing prostate surgery**: T1 or T2 prostate cancer<br><br>**Type of prostate surgery undertaken**: open RP<br><br>**Type of UI**: NR<br><br>**Participants' age**: Group I 65.0; Group II: 66.8<br><br>**Participants' BMI**: NR |

**Filocamo 2005** *(Continued)*

| | |
|---|---|
| | **Inclusion criteria**: patients who had undergone standard RRP for clinical stage T1 or T2 prostate cancer<br><br>**Exclusion criteria**: prior bladder or prostate surgery; prior UI or FI; dysfunction of the lower urinary tract; preoperative history of OAB |
| Interventions | **Group I (n = 150): early pelvic floor rehabilitation.** Began when the catheter was removed. Included Kegel exercises only, no rectal electrical stimulation or biofeedback performed. In the first session they learned how to exercise a dominant pelvic muscle contraction in a supine position. This was taught using various methods, including verbal explanations, palpation and visualisation of the contraction at the base of the penis with a mirror. At home for 10 days the patients performed daily 3 sets of exercises, alternating between 10 contractions of 5 seconds with 10 seconds of muscular relaxation. At the second session, participants were taught PFMT in sitting, standing, squatting and going up and down stairs. They were asked to perform exercises at home for 7 days. At the third session, participants were asked to practice PFM contractions only before any effort or activity that might cause UI. Exercise program was carried out by participants at home for 6 months or longer, if needed.<br><br>**Group II (n = 150): control.** No formal education in PFMT after catheter removal |
| Outcomes | • **Objective measure of incontinence:** measured using 1-hour and 24-hour pad test. Incontinence measured by number of pads used daily (1 precautionary pad signified incontinence)<br>• **Subjective measure of incontinence:** assessed using the incontinence section of the ICS-male questionnaire |
| Notes | **Conflicts of interest:** NR<br><br>**Study funding sources:** NR<br><br>**ITT analysis:** NR<br><br>**Follow-up time points:** 1, 3, 6 and 12 months<br><br>**Timing of assessment:** unclear. Quote: "This program of easy exercises was followed by patients at home for 6 months or longer, if required. Follow-up included controls at 1, 3, 6, and 12 months with objective and subjective evaluation of incontinence." However, unknown if these times were post- or during intervention<br><br>**Timing of randomisation:** after surgery, before catheter removal<br><br>**UI mentioned in inclusion criteria:** no |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "randomized"<br><br>Comment: unclear method of randomisation |
| Allocation concealment (selection bias) | Unclear risk | Not reported |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Patients would not have been able to have been blinded to the intervention they were receiving as the control group had no treatment. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |

**Filocamo 2005** *(Continued)*

| | | |
|---|---|---|
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | Quote: "All but 2/150 patients of group B, who dropped out during controls, were followed for at least 12 months."<br><br>Comment: This low rate of attrition is unlikely to affect the study conclusion. |
| Selective reporting (reporting bias) | High risk | Results of 1-hour and 24-hour pad test have not been provided. This outcome measure was stated in the methods by the authors. |
| Other bias | High risk | Not all important baseline factors have been described for the groups. BMI not stated. Details of excluded patients not available. Details of adjuvant therapies not available. |

**Franke 2000**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: July 1996 to July 1997 |
| Participants | **Number of participants randomised**: 30 (NB: 30 initially randomised but anyone who had 50 mL residual urine were excluded and 5 dropped out after randomisation)<br><br>**Country**: USA<br><br>**Setting**: Single centre<br><br>**Reason for undergoing prostate surgery**: NR in text, but likely PCa<br><br>**Type of prostate surgery undertaken**: RRP<br><br>**Type of UI**: NR<br><br>**Participants' age**: Group I: 62.3; Group II: 60.7<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: unclear, only states that men had underwent radical prostatectomy<br><br>**Exclusion criteria**: previous transurethral prostatic resection; neurological condition affecting the urinary tract; men with residual urine > 50 ml or UTI (after urine analysis performed post-randomisation) |
| Interventions | **Group I (n = NR): perineal patch electromyography biofeedback, PFME and timed voiding.** Performed using abdominal electromyography. Participants instructed to continue PFME at home (20 contractions 3 times daily). A timed voiding schedule was encouraged and participants were also instructed in the techniques to decrease urge and urgency incontinence<br><br>**Group II (n = NR): control (no intervention).** Quote: "It is not known whether controls performed pelvic floor exercises without instruction to do so. However, all patients undergoing prostatectomy at our institution are given detailed literature regarding the procedure, including postoperative instructions and expectations. There is no mention of pelvic floor exercises in this literature" |
| Outcomes | • Mean number of incontinent episodes<br>• Grams of incontinence per 24 hours |
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: NR<br><br>**ITT analysis**: NR |

**Franke 2000** *(Continued)*

**Follow-up time points**: 6, 12 and 24 weeks postoperatively

**Timing of assessment:** during intervention. Quote: "All patients completed a voiding diary and 48-hour pad test 6, 12 and 24 weeks postoperatively. Those randomized to the treatment arm underwent a 45-minute biofeedback behavioral therapy session 6, 7, 9, 11 and 16 weeks postoperatively."

**Timing of randomisation**: after catheter removal - at 6 weeks the study authors performed the residual urine analysis and interventions were started at this point. Unlikely anyone would have had a catheter at this point

**UI mentioned in inclusion criteria**: No

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "randomized"<br>Comment: unclear method of randomisation |
| Allocation concealment (selection bias) | Unclear risk | Not reported |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Patients would not have been able to have been blinded to the intervention they were receiving as the control group did not receive biofeedback or specific instructions; no other blinding mentioned |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |
| Incomplete outcome data (attrition bias)<br>All outcomes | High risk | Quote: "Results at each interval were available for 11, 10 and 8 controls, and for 13, 13 and 7 patients, respectively"<br>Comment: no study flow diagram, unable to tell how many participants were randomised into each arm initially. Seems to be minimal differential dropout but overall attrition seems high if 30 participants were initially randomised (15/30 completed, 50% attrition). No reasons for dropouts given |
| Selective reporting (reporting bias) | Low risk | All outcomes have been reported in the results |
| Other bias | Unclear risk | Only age at baseline between the two groups is reported; no other baseline information available |

**Glazener 2011a**

***Study characteristics***

| | |
|---|---|
| Methods | **Study design**: RCT<br>**Dates study conducted**: January 2005 to September 2008 |
| Participants | **Number of participants randomised**: 411<br>**Country**: UK |

**Glazener 2011a** *(Continued)*

**Setting**: multicentre (quote: "34 centres across the UK")

**Reason for undergoing prostate surgery**: Quote: "usually for prostate cancer"

**Type of prostate surgery undertaken**: RP

- Abdominal retropubic prostatectomy: Group I 157/204 (77%); Group II 161/205 (79%)
- Perineal radical prostatectomy: Group I 6/204 (3%); Group II 4/205 (2%)
- Laparoscopic radical prostatectomy: Group I 41/204 (20%); Group II 40/205 (20%)
- TURP before surgery: Group I 12/205 (6%); Group II 4/201 (2%)

**Type of UI**

- SUI: Group I 195/205 (95%); Group II 195/206 (95%)
- UUI: 135/205 (66%); Group II 156/206 (76%)
- MUI: 132/205 (81%); Group II 151/206 (73%)
- Postmicturition leakage: Group I 166/205 81%); Group II 170/206 (83%)
- Other incontinence: 72/205 (35%); Group II 91/206 (44%)

**Participants' age (years)**: Group I: 62.4 ± 5.8; Group II: 62.3 ± 5.6

**Participants' BMI**: Group I: 25.9 ± 2.9; Group II: 26.3 ± 3.3

**Inclusion criteria**: urinary incontinence at 6 weeks after prostate surgery (defined as a response indicating a loss of urine to either of two questions in the screening questionnaire: "how often do you leak urine?" and "how much do you leak?"); full informed consent; ability to comply with intervention. Men who underwent TURP who were found to have had incidental prostate cancer and were treated with RP were eligible to be recruited as new participants in the RP trial.

**Exclusion criteria**: formal referral for physiotherapy or teaching PFMT related to prostate surgery; radiotherapy planned or given during the first 3 months after surgery for men with prostate surgery; transurethral/endoscopic resection of prostate carried out as palliation for outflow obstruction in advanced prostate cancer ("channel TURP"); inability to complete study questionnaires

| | |
|---|---|
| Interventions | **Group I (n = 205): PFMT and biofeedback and bladder training (as required)**. Attended a therapist assessment of their symptoms after randomisation. The first appointment lasted an hour and consisted of assessment and training, including customised goal setting for practising exercises at home. They then attended 3 more appointments, each lasting about 45 minutes, at 2, 6 and 12 weeks after the first appointment. They were taught PFMT, with bladder training if the man had urgency or UUI (urge suppression so they were able to avoid rushing to the toilet). They were also given a booklet containing reminder instructions, as well as the lifestyle leaflet given to the men in the control arm. Biofeedback using digital anal examination was given to teach correct PFMT technique and monitor contraction strength. Although biofeedback was not used to routinely diagnose or train in the trial, therapists could use this at their discretion. Use of pads and NHS services were also documented. The PFMT regimen consisted mostly of 3 maximum strength contractions with a 10-second break between each one, practiced in three positions (lying, sitting and standing) twice daily. Men were also taught how to carry out submaximal contractions of the PFM during walking and to perform a strong contraction before and during any activity that might cause leakage.<br><br>**Group II (n = 206): standard care and lifestyle leaflet (usual care).** Standard care and a booklet containing supportive lifestyle advice but no reference to PFMT, delivered by post after randomisation. They did not receive any formal assessment but were able to access usual care and routine NHS services if they wished help with their incontinence; this could have included written advice if this was part of the hospital's care. Use of NHS services, use of pads and practicing PFMT was documented in both groups using questionnaire information. |
| Outcomes | **Primary outcomes**<br><br>• **Subjective report of urinary continence at 12 months:** incontinence was defined as an indication of urine loss to either of two questions on the ICI-SF: "how often do you leak urine?" and "how much urine do you leak?" |

**Glazener 2011a** *(Continued)*

- **Cost per quality-adjusted life year (QALY):** primary measure of cost-effectiveness

**Secondary outcomes**

- Subjective continence or improvement or UI at 3, 6 and 9 months
- Subjective improvement in continence at 12 months
- Number of incontinent episodes in past week ("objective, from diary")
- Use of absorbent pads, penile collecting sheath, bladder catheter and/or bed/chair pads
- Number and type of incontinence products used
- Coexistence, cure or development of urgency or UUI
- Urinary frequency
- Nocturia
- FI (passive or urge)
- Other bowel dysfunctions (urgency, constipation, other bowel diseases)
- Sexual function at 12 months, including information about erections, ejaculation, retrograde ejaculation, pain, change in sex life and reason for this change
- Incontinence-specific QoL: measured using ICI-Q, 10-point scale
- General health measures: assessed using SF-12, EQ-5D
- Need for alternative incontinence management (e.g. surgery, medication)
- Use of a GP, nurse, consultant urologist or physiotherapist
- Satisfaction with incontinence treatment after prostate surgery
- Visits to GP
- Visits to practice nurse
- Use of PFMT
- Lifestyle changes: weight, constipation, lifting, coughing, exercise
- Patient costs (e.g. self-care such as pads and laundry, travel to health services and sick leave)
- Cost of conservative trial treatment
- Cost of alternative or additional NHS treatments (such as pads, catheters, medications, hospital admissions, further surgery)
- Other cost-effectiveness measures (e.g. incremental cost per additional continent man at 12 months)

Notes

**Conflicts of interest**: "None"

**Study funding sources**: Quote: "The National Institute for Health Research Health Technology Assessment programme."

**ITT analysis**: yes

**Follow-up time points**: 3, 6, 9 and 12 months

**Timing of assessment:** post-randomisation. Quote: "The men in the intervention group attended for a MAPS therapist assessment of their symptoms after randomisation [...] The men then attended a further three appointments, each lasting approximately 45 minutes, at around 2, 6 and 12 weeks after the first appointment." "Men were recruited between January 2005 and September 2008. Follow-up continued with 3-monthly questionnaires and urinary diaries for 12 months from the date of the last randomisation"

**Timing of randomisation**: Post catheter removal ("Urinary incontinence at 6 weeks after prostate surgery")

**UI mentioned in inclusion criteria**: Yes Quote: ("Urinary incontinence at 6 weeks after prostate surgery")

**Note:** although bladder training was only given to those with urgency or UUI, we considered it to be an active intervention alongside PFMT and biofeedback for this review as more than 65% of the men in the study were stated to have UUI at baseline; these men would have received the biofeedback.

**Glazener 2011a** *(Continued)*

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "Randomisation was by computer allocation using the randomisation service of the Centre for Healthcare Randomised Trials (CHaRT, in the Health Services Research Unit, University of Aberdeen). Allocation was stratified by type of operation (radical prostatectomy or TURP) and minimised using centre, age and pre-existing urinary incontinence. The process was independent of all clinical collaborators."<br><br>Comment: adequate method |
| Allocation concealment (selection bias) | Unclear risk | Quote: "The study office informed all men of their allocation by post."<br><br>Comment: unclear what is meant by "informed" and whether these specific study personnel were blinded |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Quote: "As the trial arm to which men were allocated could not be concealed after randomisation had occurred from either the man or the therapist, blinding of participants to intervention was not possible."<br><br>Comment: not possible to blind |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Low risk | Quote: "However, outcome measures were assessed using questionnaires that were processed by MAPS study office staff who were not aware of the randomisation.<br>The statistician responsible for the final analyses was not the same as the one who performed the interim analyses for the Data Monitoring Committee. All statistical coding and results were agreed before the allocation was revealed."<br><br>Comment: measures adequately blinded |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | 196/205 in intervention group and 195/206 in control group completed the study; no differential or large attrition rate and reasons for dropouts explained. Stated that 90% of all participants returned completed questionnaires and 95% of whom it was appropriate to follow-up returned at each time point. |
| Selective reporting (reporting bias) | Unclear risk | Prospectively registered. Most of the outcomes specified in the protocol appear to be reported, except 'Duration of incontinence based on time of resolution relative to time of operation and randomisation'; this is not mentioned in the list of changes to the study protocol in the main report. |
| Other bias | Unclear risk | Men who had already undergone TURP who were found to have had incidental PCa and were treated with RP were eligible to be recruited as new participants in the RP trial. It is unclear what the effect of including these men who had already undergone a separate prostate procedure may have had on the results. |

**Glazener 2011b**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: January 2005 to September 2008 |
| Participants | **Number of participants randomised**: 442 |

**Glazener 2011b** *(Continued)*

**Country**: UK

**Setting**: multicentre (quote: "34 centres across the UK")

**Reason for undergoing prostate surgery**: "usually for benign prostatic hypertrophy"

**Type of prostate surgery undertaken**: TURP

- Standard TURP: Group I 199/220 (90%); Group II 199/222 (90%)
- Laser TURP: Group I 10/220 (5%); Group II 15/222 (7%)
- TURP and other procedure: Group I 11/220 (5%); Group II 8/222 (4%)
- TURP before other surgery: Group I 23/217 (11%); Group II 26/218 (12%)

**Type of UI**:

- SUI: Group I 148/220 (67%); Group II 136/222 (61%)
- UUI: Group I 186/220 (85%); Group II 183/222 (82%)
- MUI: 129/220 (59%); Group II 112/222 (50%)
- Postmicturition leakage: Group I 151/220 (69%); Group II 156/222 (70%)
- Other incontinence: Group I 57/220 (26%); Group II 44/222 (20%)

**Participants' age**: Group I: 68.2 ± 7.7; Group II: 67.9 ± 8.1

**Participants' BMI**: Group I: 27.1 ± 4.1; Group II: 27.1 ± 4.7

**Inclusion criteria**: urinary incontinence at 6 weeks after prostate surgery (defined as a response indicating a loss of urine to either of two questions in the screening questionnaire: "how often do you leak urine?" and "how much do you leak?"); full informed consent; ability to comply with intervention. If cancer was diagnosed after randomisation, the men remained in the TURP group as allocated, even if they subsequently underwent radiotherapy or RP

**Exclusion criteria**: formal referral for physiotherapy or teaching PFMT related to prostate surgery; radiotherapy planned or given during the first three months after surgery for men with prostate surgery; transurethral/endoscopic resection of prostate carried out as palliation for outflow obstruction in advanced prostate cancer ("channel TURP"); inability to complete study questionnaires. If prostate cancer was identified before randomisation and either RP or radiotherapy were planned within three months, they were not eligible for the TURP trial.

| | |
|---|---|
| Interventions | **Group I (n = 220): PFMT and biofeedback and bladder training (as required)**. Attended a therapist assessment of their symptoms after randomisation. The first appointment lasted an hour and consisted of assessment and training, including customised goal setting for practising exercises at home. They then attended three more appointments, each lasting about 45 minutes, at 2, 6 and 12 weeks after the first appointment. They were taught PFMT, with bladder training if the man had urgency or UUI (urge suppression so they were able to avoid rushing to the toilet). They were also given a booklet containing reminder instructions, as well as the lifestyle leaflet given to the men in the control arm. Biofeedback using digital anal examination was given to teach correct PFMT technique and monitor contraction strength. Although biofeedback was not used to routinely diagnose or train in the trial, therapists could use this at their discretion. Use of pads and NHS services were also documented. The PFMT regimen consisted mostly of three maximum strength contractions with a 10-second break between each one, practiced in three positions (lying, sitting and standing) twice daily. Men were also taught how to carry out submaximal contractions of the PFM during walking and to perform a strong contraction before and during any activity that might cause leakage.<br><br>**Group II (n = 222): standard care and lifestyle leaflet (usual care).** Standard care and a booklet containing supportive lifestyle advice but no reference to PFMT, delivered by post after randomisation. They did not receive any formal assessment but were able to access usual care and routine NHS services if they wished help with their incontinence; this could have included written advice if this was part of the hospital's care. Use of NHS services, use of pads and practicing PFMT was documented in both groups using questionnaire information. |
| Outcomes | **Primary outcomes** |

**Glazener 2011b** *(Continued)*

- **Subjective report of urinary continence at 12 months:** incontinence was defined as an indication of urine loss to either of two questions on the ICI-SF: "how often do you leak urine?" and "how much urine do you leak?"
- **Cost per quality-adjusted life year (QALY):** primary measure of cost-effectiveness

**Secondary outcomes**

- Subjective continence or improvement or UI at 3, 6 and 9 months
- Subjective improvement in continence at 12 months
- Number of incontinent episodes in past week ("objective, from diary")
- Use of absorbent pads, penile collecting sheath, bladder catheter and/or bed/chair pads
- Number and type of incontinence products used
- Coexistence, cure or development of urgency or UUI
- Urinary frequency
- Nocturia
- FI (passive or urge)
- Other bowel dysfunctions (urgency, constipation, other bowel diseases)
- Sexual function at 12 months, including information about erections, ejaculation, retrograde ejaculation, pain, change in sex life and reason for this change
- Incontinence-specific QoL: measured using ICI-Q, 10-point scale
- General health measures: assessed using SF-12, EQ-5D
- Need for alternative incontinence management (e.g. surgery, medication)
- Use of a GP, nurse, consultant urologist or physiotherapist
- Satisfaction with incontinence treatment after prostate surgery
- Visits to GP
- Visits to practice nurse
- Use of PFMT
- Lifestyle changes: weight, constipation, lifting, coughing, exercise
- Patient costs (e.g. self-care such as pads and laundry, travel to health services and sick leave)
- Cost of conservative trial treatment
- Cost of alternative or additional NHS treatments (such as pads, catheters, medications, hospital admissions, further surgery)
- Other cost-effectiveness measures (e.g. incremental cost per additional continent man at 12 months)

Notes

**Conflicts of interest**: "None"

**Study funding sources**: Quote: "The National Institute for Health Research Health Technology Assessment programme."

**ITT analysis**: yes

**Follow-up time points**: 3, 6, 9 and 12 months

**Timing of assessment:** post-randomisation. Quote: "The men in the intervention group attended for a MAPS therapist assessment of their symptoms after randomisation [...] The men then attended a further three appointments, each lasting approximately 45 minutes, at around 2, 6 and 12 weeks after the first appointment." "Men were recruited between January 2005 and September 2008. Follow-up continued with 3-monthly questionnaires and urinary diaries for 12 months from the date of the last randomisation"

**Timing of randomisation**: Post catheter removal ("Urinary incontinence at 6 weeks after prostate surgery")

**UI mentioned in inclusion criteria**: Yes ("Urinary incontinence at 6 weeks after prostate surgery")

**Glazener 2011b** *(Continued)*

| | |
|---|---|
| | **Note:** although bladder training was only given to those with urgency or UUI, we considered it to be an active intervention alongside PFMT and biofeedback for this review as more than 80% of the men in the study were stated to have UUI at baseline; these men would have received the biofeedback. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "Randomisation was by computer allocation using the randomisation service of the Centre for Healthcare Randomised Trials (CHaRT, in the Health Services Research Unit, University of Aberdeen). Allocation was stratified by type of operation (radical prostatectomy or TURP) and minimised using centre, age and pre-existing urinary incontinence. The process was independent of all clinical collaborators."<br><br>Comment: adequate method |
| Allocation concealment (selection bias) | Unclear risk | Quote: "The study office informed all men of their allocation by post."<br><br>Comment: unclear what is meant by "informed" and whether these specific study personnel were blinded |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Quote: "As the trial arm to which men were allocated could not be concealed after randomisation had occurred from either the man or the therapist, blinding of participants to intervention was not possible."<br><br>Comment: not possible to blind |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Low risk | Quote: "However, outcome measures were assessed using questionnaires that were processed by MAPS study office staff who were not aware of the randomisation.<br>The statistician responsible for the final analyses was not the same as the one who performed the interim analyses for the Data Monitoring Committee. All statistical coding and results were agreed before the allocation was revealed."<br><br>Comment: measures adequately blinded |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | 194/220 in intervention group and 203/222 in control group completed the study; no concerning differential or large attrition rate and reasons for dropouts explained. Stated that 90% of all participants returned completed questionnaires and 90% of whom it was appropriate to follow-up returned at each time point. |
| Selective reporting (reporting bias) | Unclear risk | Prospectively registered. Most of the outcomes specified in the protocol appear to be reported, except 'Duration of incontinence based on time of resolution relative to time of operation and randomisation'; this is not mentioned in the list of changes to the study protocol in the main report |
| Other bias | Low risk | Nothing to suggest any other sources of bias |

**Gomes 2018**

***Study characteristics***

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|---|---|
| Methods | **Study design**: multi-arm RCT<br><br>**Dates study conducted**: March 2012 to March 2015 |

**Gomes 2018** *(Continued)*

| | |
|---|---|
| Participants | **Number of participants randomised**: 110<br><br>**Country**: Brazil<br><br>**Setting**: single centre ("a single teaching hospital")<br><br>**Reason for undergoing prostate surgery**: PCa (Quote: "All patients had localized tumors (stage T1c to T2c)")<br><br>**Type of prostate surgery undertaken**: RP<br><br>• VLP surgery: Group I: 23 (68%); Group II: 17 (49%); Group III: 20 (57%)<br>• Open surgery: Group I: 11 (32%); Group II: 18 (51%); Group III: 15 (43%)<br><br>**Type of UI**:<br><br>• SUI: Group I: 25 (74%); Group II: 28 (80%); Group III: 30 (86%)<br>• UUI: Group I: 1 (3%); Group II: 1 (3%); Group III: 1 (3%)<br>• MUI: Group I: 8 (23%); Group II: 6 (17%); Group III: 4 (11%)<br><br>**Participants' age**: Group I (n = 34): 66.62 ± 5.66; Group II (n = 35): 65.83 ± 5.64; Group III (n = 35): 63.11 ± 7.19<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: between 50 and 75 years old; underwent RP at a single teaching hospital; complaint of PPI (defined as using one or more pads a day)<br><br>**Exclusion criteria**: reporting previous treatments for UI; cardiac pacemaker implant; cognitive impairment; neurological diseases; limiting or acute musculoskeletal disorders; those unable to attend the weekly sessions |
| Interventions | **Group I (n = 36): Pilates.** 10 weekly sessions of Pilates mat exercises in pairs, on the ground during 45 minutes. They received written guidelines to perform daily exercises at home. A Pilates instructor blinded to the results of other groups guided the exercises.<br><br>**Group II (n = 38): PFMT and electrical stimulation.** 10 weekly sessions of PFMT for 45 minutes, combined with anal electrical stimulation with intracavity electrode (Dualpex device 961 uro®; Quark Medical Products; Anvisa registration no. 80079190022). A continence-specialised physiotherapist blinded to the other groups was responsible for the sessions. In the case of SUI, participants underwent AES with a 50 Hz current (high frequency) for 20 minutes, before performing a series of voluntary contractions of the pelvic floor muscles (three sets of 10 contractions in the supine position, sitting and standing). For those with UUI, AES was set at 4 Hz (low frequency) for 20 minutes, and followed the same series of voluntary PFM contractions. For those with MUI, both electrical parameters were used, followed by the same set of PFM exercises. Participants received written guidelines to perform the same protocol of PFM exercises at home every day.<br><br>**Group III (n = 36): control (no treatment).** Initial evaluation and no instructions to perform PFMT at home. All participants with persistent UI at the end of the study were invited to start supervised treatment at the university hospital. |
| Outcomes | **Primary outcomes**<br><br>• **Improvement in pelvic floor strength:** 4 months after surgery; assessed using perineometry<br><br>**Secondary outcomes**<br><br>• **24-hour pad-test outcomes.** Pad tests were undertaken on regular working days and provided a secondary definition of urinary continence (cutoff ≤ 8 g/day).<br>  ○ A: Proportion with 0 pads<br>  ○ B: Pad test weight < 8 g QoL scores (mean reduction of ICIQ-SF scores). |

**Gomes 2018** *(Continued)*

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|---|---|
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: NR<br><br>**ITT analysis**: no (data only analysed for those who finished study)<br><br>**Follow-up time points**: 4 months<br><br>**Timing of assessment:** possibly post-randomisation. Quote: "Final assessment was performed 4 months after RP". The men underwent 10 weekly sessions and were assessed for eligibility for the study four weeks after RP (14 weeks total). Assuming that 4 months is approximately 16 weeks, this means the assessment took place post-randomisation.<br><br>**Timing of randomisation**: probably after catheter removal: 4 weeks post-surgery<br><br>**UI mentioned in inclusion criteria**: yes - "with complaint of PPUI" |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "Patients were randomized by sealed envelopes into three treatment groups"<br><br>Comment: specific method of randomisation unclear |
| Allocation concealment (selection bias) | Low risk | Quote: "Patients were randomized by sealed envelopes into three treatment groups"<br><br>Comment: probably refers to adequate allocation |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Participants would not have been able to be have been blind to the nature of the interventions. However, it is stated that the Pilates instructor in Group I and the physiotherapist for Group II were blinded |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Low risk | Quote: "An independent researcher, who was unaware of the patient's treatment groups performed both baseline and final evaluations."<br><br>Comment: adequate blinding |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | Quote: "One hundred and ten patients were then randomized and 104 patients completed the study protocol"<br><br>Comment: 34/36 completed in Group I, 35/38 in Group II and 35/36 in Group III. No differential loss to follow-up and reasons for dropouts adequately explained in text |
| Selective reporting (reporting bias) | Low risk | Prospectively registered and all outcomes stated in the trial registration are reported in the text. |
| Other bias | Low risk | Nothing to suggest any other sources of bias. |

**Goode 2011**

***Study characteristics***

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|---|---|
| Methods | **Study design**: multi-arm RCT |

**Goode 2011** *(Continued)*

| | |
|---|---|
| | **Dates study conducted**: January 2003 and June 2009 |
| Participants | **Number of participants randomised**: 208<br><br>**Country**: USA<br><br>**Setting**: multicentre (quote: "multisite")<br><br>**Reason for undergoing prostate surgery**: NR but likely PCa<br><br>**Type of prostate surgery undertaken**: RP<br><br>**Type of UI**:<br><br>• Urge: Group I: 1 (1.4%); Group II: 2 (2.9%); Group III: 1 (1.5%)<br>• Stress: Group I: 31 (44.3%); Group II: 33 (47.1%); Group III: 30 (44.1%)<br>• Mixed: Group I: 38 (54.3%); Group II: 35 (50%); Group II: 37 (54.4%)<br><br>**Participants' age (years)**: Group I: 66.3 ± 7.5; Group II: 66.8 ± 7.0; Group III: 66.9 ± 7.7<br><br>**Participants' BMI**: Group I: 30.0 ± 5.2; Group II: 27.9 ± 4.1; Group III: 29.0 ± 5.4<br><br>**Inclusion criteria**: community-dwelling men with incontinence persisting at least one year after RP<br><br>**Exclusion criteria**: men incontinent before prostatectomy; men who resolved post-prostatectomy incontinence and then developed incontinence at a later time; fewer than 2 incontinence episodes per week; prostatectomy within 1 year of study entry; current active prostate cancer treatment other than hormonal therapy; postvoid residual volume > 200 mL; prior treatment in structured behavioural therapy program; artificial urinary sphincter or suburethral sling; cardiac pacemaker; Mini-Mental State Examination score < 24; inability to quantify individual leakage episodes on bladder diary; unstable medical conditions |
| Interventions | **Group I (n = 70): behavioural therapy (PFMT, bladder training, fluid management)**. Undertaken in 4 visits approximately 2 weeks apart by physician investigators or nurse practitioners. First visit consisted of an explanation of continence-related anatomy and PFMT, followed by teaching using anal palpation. The participants were instructed in PFM contraction without breath holding or contraction or abdominal, thigh or buttock muscles. Home exercises consisted of 3 daily sessions (1 each lying, sitting, standing) with 15 repetitions of a 2 to 10 second contraction followed by an equal period of relaxation depending on participant's demonstrated ability. The contraction and relaxation was advanced by 1 second per week to a maximum of 10 to 20 seconds. They were asked to practice interrupting or slowing the urinary stream during voiding once daily for the first 2 weeks. They kept daily bladder diaries and exercise logs during 8 weeks of treatment. They received a fluid management handout defining normal intake, consisting of drinking 6 to 8 fluid ounce glasses daily, as well as advising them to avoid caffeine and distribute their fluid consumption throughout the day. At the second visit, they were taught bladder control strategies. The strategy for SUI was to contract pelvic floor muscles just before and during activities that could cause leakage. The urge control strategy included not rushing to the toilet but to stay still and contract the pelvic muscles until the urgency passed, before proceeding to the toilet normally. In subsequent visits, the diaries were reviewed and strategies discussed in detail to improve results and adherence. If the diary did not document at least a 50% reduction in incontinence episodes at the third visit, PFMT was repeated.<br><br>**Group II (n = 70): behavioural therapy (PFMT, bladder training, fluid management) + biofeedback + electrical stimulation.** Conducted similarly to Group I but with additional in-office dual-channel BFB and daily home PFMT. At the first visit, the PFMT was taught using feedback from surface electromyograph electrodes placed over the rectus abdominis muscles and perianally with an anal probe. Men were coached in how to achieve a reliable and sustained contraction without contracting the rectus abdominus muscles. Electrical stimulation was conducted in-office at the first visit, using the home unit, an anal probe and settings of 20 Hz, pulse width 1 millisecond, duty cycle of 5 seconds on 15 seconds off and current up to 100 mA (adjusted to achieve a palpable pelvic floor contraction). As well as 15-minute sessions of home ES, the participants were to perform 2 daily sessions of PFMT. BFB was repeated at the third visit if incontinence frequency had not decreased by 50%. |

**Goode 2011** *(Continued)*

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|---|---|
| | **Group III (n = 68): control (delayed treatment).** Particpants kept bladder dia ires, reviewed during their clinical visits every 2 weeks for 8 weeks to control for self-monitoring effects as well as to receive the attention of staff. After the 8 weeks, they were offered the protocol treatment with choice of behavioural therapy either with or without BFB and ES |
| Outcomes | **Primary outcome**<br>• **Reduction in number of incontinence episodes at 8 weeks:** assessed by 7-day bladder diary an scored by study staff blinded to group assignment<br>**Secondary outcomes**<br>• **Lower urinary tract symptoms:** assessed using the American Urological Index (AUA-7) symptom indexInternational Prostate Symptom Score: quality of life question<br>• **Condition-specific quality of life:** assessed with Incontinence Impact Questionnaire and the Expanded Prostate Cancer Index Composite (EPIC)<br>• **General quality of life:** assessed with 36-Item Short Form Health Survey<br>• **Patients' perceptions of treatment effects:** assessed with Global Perception of Improvement and the Patient Satisfaction Question |
| Notes | **Conflicts of interest**: Quote: "All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Dr Goode reported receiving a research grant from Pfizer. Dr Burgio reported serving on the advisory board of Astellas, as a consultant to GlaxoSmithKline, and as receiving research grants and serving as a consultant to Pfizer. Dr Johnson reported receiving grant support from Astellas, Pfizer and Vantia and serving as a consultant for Boehringer-Ingelheim, Ferring, Johnson & Johnson, Pfizer, and Vantia. Dr Issa reported serving as a consultant for and on the speakers bureau and receiving honoraria from GlaxoSmithKline. Dr Lloyd reported receiving research support from Allergan, Indevus, and Pfizer; serving as a consultant to and on the speakers bureau of Astellas, Boehringer-Ingelheim, GlaxoSmithKline, Novartis, and Pfizer. No other authors reported having a financial conflict of interest"<br>**Study funding sources**: "This study was supported by grant R01 DK60044 from the National Institute of Diabetes and Digestive and Kidney Diseases and by the Department of Veterans Affairs Birmingham–Atlanta Geriatric Research, Education, and Clinical Center."<br>**ITT analysis**: yes, for primary outcome<br>**Follow-up time points**: 8 weeks, 6 months, 12 months<br>**Timing of assessment:** assumed post-randomisation. Quote: "Behavioral therapy was implemented in 4 visits approximately 2 weeks apart by physician investigators or nurse practitioners." "The primary outcome measure was percent reduction in number of incontinence episodes at 8 weeks as measured with a 7-day bladder diary"<br>**Timing of randomisation**: after catheter removal - had to have UI at least 1 year post-surgery<br>**UI mentioned in inclusion criteria**: yes |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "Participants were stratified by site (1 university and 2 VA medical centers), and by incontinence type (stress, urgency, or mixed) and severity (5, 5-10, or 10 episodes per week) to ensure equal distribution among treatment groups. For each site, for each of the 9 stratification cells, a random assignment schedule was generated by a computer program written by the biostatistician (D.L.R.)."<br>Comment: adequate randomisation |

**Goode 2011** *(Continued)*

| | | |
|---|---|---|
| Allocation concealment (selection bias) | Low risk | Quote: " To maintain allocation concealment, group assignments were placed in sealed envelopes and opened sequentially at the time of randomization."<br><br>Comment: seems adequate |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Quote: "a limitation of our study is that it was unblinded"<br><br>Comment: would have been impossible to blind participants as to whether they were in the behavioural only, behavioural + BFB + ES or control groups; blinding of personnel not mentioned. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Low risk | Quote: "All instruments were completed at home, brought to the clinic, and scores tabulated and entered by research staff who were blinded to group assignment."<br><br>Comment: appears to be adequately blinded |
| Incomplete outcome data (attrition bias)<br>All outcomes | High risk | 47/70 completed in behavioural group, 40/70 completed in behavioural + BFB + Estim group and 64/68 completed in control. Overall, more than 20% attrition in the trial and differential loss to follow-up between behavioural arms and the control arm. ITT performed, but only for primary outcome. |
| Selective reporting (reporting bias) | Unclear risk | Study prospectively registered. Only primary outcomes listed in the trial registration, no secondary outcomes mentioned. Does not appear to be an explanation for the additional analyses in the full text. |
| Other bias | Unclear risk | In the behaviour + BFB + Estim group, more men had previously undertaken some form of PFMT (55.7% compared to 35.7% in the behaviour only arm and 47.1% in the control arm). Unsure what impact this could have on the results. |

**Kakihara 2007**

| | |
|---|---|
| ***Study characteristics*** | |
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: May 2003 to September 2004 |
| Participants | **Number of participants randomised**: 20<br><br>**Country**: Brazil<br><br>**Setting**: Single centre<br><br>**Reason for undergoing prostate surgery**: NR in text but likely prostate cancer<br><br>**Type of prostate surgery undertaken**: open RP<br><br>**Type of UI**: Group I: UUI 4, SUI 6; Group II: UUI 5, SUI 5<br><br>**Participants' age**: 64.3 ± 5.2 years (variation of 56 to 72 years of age)<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: adult participants submitted to RP who displayed UI with a minimum post-surgery period of 6 months and who had undergone a urodynamic test<br><br>**Exclusion criteria**: current urinary infection, patients already submitted to incontinence correction surgery, patients fitted with any kind of pacemaker |

**Kakihara 2007** *(Continued)*

| | |
|---|---|
| Interventions | **Group I (n = 10): Physical therapy with PFMT and electrical stimulation**. Participants originally trained to contract elevator muscle in the anus in supine, lateral decubitus, sitting and standing positions. Contractions started at 2 seconds with 4 second relaxation; the timing of contraction and relaxation increased daily until there was a maximum of 10 seconds contraction and 20 relaxation. They would then start again from 2 seconds and 4 seconds. They were asked to perform 90 contractions a day: 30 in the morning, 30 in the afternoon and 30 in the evening. Additionally, the participants underwent electro-stimulation with an endo-anal electrode once a week for 20 minutes. For the initial 3 months, the frequency used for participants with detrusor instability and UUI was 8Hz, while for sphincter deficiency and SUI it was 35Hz. This was increased to 10Hz and 50Hz after three months, respectively.<br><br>**Group II (n = 10): Control - PFMT alone.** Participants originally trained to contract elevator muscle in the anus in supine, lateral decubitus, sitting and standing positions. Contractions started at 2 seconds with 4 second relaxation; the timing of contraction and relaxation increased daily until there was a maximum of 10 seconds contraction and 20 relaxation. They would then start again from 2 seconds and 4 seconds. They were asked to perform 90 contractions a day: 30 in the morning, 30 in the afternoon and 30 in the evening. |
| Outcomes | • **One-hour pad test:** incontinence ranked as light (2g to 10g), moderate (11 to 50 g), serious (51 g to 100 g) or very serious (more than 100 g)<br>• **Incontinence VAS:** participant chooses a score between 0 and 10, with 0 representing no incontinence and 10 representing a great problem, during the period of time up to each assessment<br>• **Patient report of number of diapers used each day** |
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: NR<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 3, 6 and 12 months<br><br>**Timing of assessment:** during and post-intervention. Quote: "Patients were reassessed after 3, 6 and 12 months from the beginning of the physical therapy treatment."<br><br>**Timing of randomisation**: at least 6 months following surgery<br><br>**UI mentioned in inclusion criteria**: yes |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "randomly divided"<br><br>Comment: unclear method of randomisation |
| Allocation concealment (selection bias) | Unclear risk | Not reported |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Patients would not have been able to have been blinded to the intervention they were receiving as the control group did not receive Estim; no other blinding mentioned. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |

**Kakihara 2007** *(Continued)*

| | | |
|---|---|---|
| Incomplete outcome data (attrition bias)<br>All outcomes | High risk | In the intervention group: "10 patients were observed and, at the end of the 12-month period, 8 patients in this group were assessed because 2 had been discharged in the 3rd and 6th month and were excluded from the final analysis". This is a 20% loss to follow-up and differential attrition with the control group (10/10 at 12 months) |
| Selective reporting (reporting bias) | High risk | Some patients were 'discharged' from the study since they were dry. The outcome of those patients has not been included. |
| Other bias | Unclear risk | Very few baseline characteristics of participants presented; data were not normally distributed (known as they used a non-parametric test for their statistical analyses) so unclear whether there had been an issue in selection and randomisation. |

**Laurienzo 2018**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: multi-arm RCT<br>**Dates study conducted**: October 2011 to September 2014 |
| Participants | **Number of participants randomised**: 132<br>**Country**: Brazil<br>**Setting**: Single centre<br>**Reason for undergoing prostate surgery**: prostate cancer<br>**Type of prostate surgery undertaken**: RP<br>**Type of UI**: NR<br>**Participants' age (years)**: Group I: 58.0 ± 5.7; Group II: 58.5 ± 5.4; Group III: 57.3 ± 6.5<br>**Participants' BMI**: Group I: 27.1 ± 4.0; Group II: 26.9 ± 4.2; Group III: 26.4 ± 4.1<br>**Inclusion criteria**: higher than 2 g on 1-hour pad test 1 month after RP<br>**Exclusion criteria**: prior pelvic floor muscle dysfunction (urinary or faecal incontinence), stenosis of the anastomosis or not being able to complete the protocol for any reason |
| Interventions | **Group I (n = 41): Guideline (PFMT).** Instructed to perform 3 types of home exercises to strengthen the pelvic floor (elevation of the hip, contraction of the thigh adductors, pelvic floor contraction and relaxation). The participants were instructed and encouraged to perform these at home two or three times daily until they completed 6 months of the postoperative period.<br>**Group II (n = 42): electrical stimulation and guideline (PFMT).** Instructed to undertake the same exercises as the guideline group, but also received anal electro-stimulation therapy with the same physiotherapist twice a week for 7 weeks (14 sessions total). The electrical stimulation was delivered by Dualpex Uro 961, Quark® (Registration at Anvisa number 80079190018) and was set at 35 Hz frequency, 1 ms pulse width, rise time of 2 seconds, stimulus duration of 6 seconds, fall time of 2 seconds, standing time of 12 seconds. The intensity was modified to promote a visible pelvic floor contraction without discomfort.<br>**Group III (n = 40): control.** Routine instructions about postoperative period at the time of hospital discharge. "No type of treatment or orientation of home exercises was performed in this group" |

**Laurienzo 2018** *(Continued)*

| | |
|---|---|
| Outcomes | **Primary outcome**<br>• **Recovery of pelvic floor muscle strength:** assessed through perineometry between groups.<br>**Secondary outcomes**<br>• **Urine loss:** measured by 1-hour pad test<br>• **Quality of life:** measured using ICIQ-SF score<br>• **Erectile dysfunction:** measured using IIEF-5 score<br>• **Urinary symptoms:** measured using IPSS score |
| Notes | **Conflicts of interest**: "There are no conflicts of interest in the study."<br>**Study funding sources**: "This study was funded by the Foundation for Research Support of the State of São Paulo (FAPESP), under registration number 2011/12154-7."<br>**ITT analysis**: NR<br>**Follow-up time points**: 3 and 6 months. NB: the paper notes that there was a preoperative assessment and an assessment at one month following surgery. However, the participants were randomised at one month after surgery, making the one month time point the baseline measure for the study.<br>**Timing of randomisation**: at least one month following surgery<br>**Timing of assessment:** unclear. Quote: "The eligibility criterion was set to patients who presented higher than 2 g in a 1-hour pad test 1 month after RP." "All patients were evaluated preoperatively and at 1, 3, and 6 months after RP". Eligibility criteria is for men at least 1 month after RP, but assessment also includes postoperative examination.<br>**UI mentioned in inclusion criteria**: Yes<br>**Correspondence with study authors:** we contacted the study authors on 6 December 2021 and again on 24 January 2022 to enquire further as to whether the data were presented with minimum and maximum values or IQRs but did not receive a response. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "A computer-generated random list of group assignments was prepared and was blocked with a random block size, to reduce the possibility of guessing the next assignment"<br>Comment: seems adequate |
| Allocation concealment (selection bias) | Low risk | Quote: "Assignment was placed in numbered opaque envelopes and sealed. Envelopes were opened by an individual not directly involved with the study."<br>Comment: seems adequate |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Quote: "Only one researcher physiotherapist (A.CEL) was informed about the randomization of the patients and was the one who performed the interventions. The other evaluators in the study were all blind."<br>Comment: seems as though the person delivering interventions was not blind. Would have also been difficult to blind the participants given the nature of the interventions. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Low risk | Quote: "All measurements were applied by a blind researcher"<br>Comment: seems adequate |

**Laurienzo 2018** *(Continued)*

| | | |
|---|---|---|
| Incomplete outcome data (attrition bias) All outcomes | Low risk | 41/44 analysed in Group I, 42/45 in Group II, 40/43 in Group III - no differential loss to follow-up and low attrition with reasons explained in the study flow diagram. |
| Selective reporting (reporting bias) | High risk | The trial registration does not contain details of the quality of life assessment; does not appear to be an explanation for this analysis in the text. |
| Other bias | Low risk | Nothing to suggest any other sources of bias. |

**Manassero 2007**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: May 2003 to January 2005 |
| Participants | **Number of participants randomised**: 107<br><br>**Country**: Italy<br><br>**Setting**: single centre<br><br>**Reason for undergoing prostate surgery**: localised prostate cancer<br><br>**Type of prostate surgery undertaken**: RRP with either no nerve sparing, monolateral nerve sparing or bilateral nerve sparing<br><br>**Type of UI**: NR<br><br>**Participants' age**: Group I (n = 54): 66.8 ± 6.3; Group II (n = 40): 67.9 ± 5.5<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: could comply with the protocol and regularly attend hospital appointments; objectively confirmed UI (> 2 g urine loss on 24 hour pad test); "good general conditions"<br><br>**Exclusion criteria**: history of preoperative incontinence; significant perioperative complications; active rectal lesions or infections; psychiatric or neurological disorders; inability to contract the pelvic floor muscles or with a weak contraction; detrusor overactivity |
| Interventions | **Group I (n = 54): Pelvic floor re-education program:** participants took part in the program for as long as the incontinence persisted, within a 1 year period. The program involved active PFE. Verbal feedback of the contraction was used to instruct patients to correctly and selectively contact pelvic muscles while relaxing the abdominal muscles and the strength was measured using a digital anal control. Patients not able to contract were given ES at home with an anal probe to learn how to contract muscles but were not included in the study. Home practice initially comprised of 45 contractions (3 sessions of 15) per day, progressively increasing the number until 90 per day were performed. Therapy was taught and described by two experienced pelvic floor urologists.<br><br>**Group II (n = 53): control.** Particpiants were only assessed on their rate of residual incontinence. |
| Outcomes | **Primary outcome**<br><br>• Quote: "The primary endpoints were the incontinence rates at 1, 3, 6, and 12 months following surgery"<br><br>**Secondary outcomes** |

**Manassero 2007** *(Continued)*

- Quote:"The secondary endpoints were the correlation between the subjective assessment of incontinence on the VAS, the objective one on 24 hr Pad test and the QoL, and the correlation of incontinence rate with nerve-sparing surgery and age"

Notes

**Conflicts of interest**: Quote: "No conflict of interest reported by the author(s)."

**Study funding sources**: NR

**ITT analysis**: NR

**Follow-up time points**: 1, 3, 6 and 12 months

**Timing of assessment:** unclear. Quote: "Each patient in both groups received an individual evaluation in outpatient clinic at 1 week, 1, 3, 6, and 12 months after catheter removal." Timing of randomisation unclear, so unclear whether or not the timing of assessment took place post-randomisation or post-surgery.

**Timing of randomisation**: after surgery, 1 week after catheter removal

**UI mentioned in inclusion criteria**: yes

**Contact with authors:** it is unclear whether the primary outcome was measured using the 24-hour pad test or the subjective VAS. We contacted the authors on 6 December 2021 and on 24 January 2022 for clarification. The study authors confirmed whether the data presented was objective or subjective.

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Comment: "The randomization was performed using a computer-generated random numbers"<br><br>Comment: seems adequate |
| Allocation concealment (selection bias) | Unclear risk | Not reported |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Patients would not have been able to have been blinded to the intervention they were receiving as the control group did not receive PFMT; no other blinding mentioned. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Low risk | Quote: "All the assessments were done and data collected by two blinded assessors, different from the instructors"<br><br>Comment: probably adequate |
| Incomplete outcome data (attrition bias)<br>All outcomes | High risk | At 12 months, 54/54 in intervention group and 40/53 in control group completed the trial. Reasons partially explained narratively. Differential loss to follow-up and no ITT. |
| Selective reporting (reporting bias) | High risk | Actual outcome data not provided for several outcomes. |
| Other bias | High risk | At baseline, participants in the control group had less incontinence than those in the intervention group (97 g in control compared to 247 g in intervention group). Baseline measurements were only reported for those who completed the trial, but this suggests a potential issue with randomisation procedure. BMI not provided. Ancillary treatment including radiation therapy not described. |

### Moore 1999a

| *Study characteristics* | |
|---|---|
| Methods | **Study design**: multi-arm RCT<br><br>**Dates study conducted**: December 1995 to February 1997 |
| Participants | **Number of participants randomised**: 63<br><br>**Country**: Canada<br><br>**Setting**: multicentre (quote: "three university-affiliated hospitals in Edmonton")<br><br>**Reason for undergoing prostate surgery**: NR in text, but likely PCa<br><br>**Type of prostate surgery undertaken**: RRP<br><br>**Type of UI**: mostly NR, though 4 had urodynamically-proven SUI<br><br>**Participants' age (mean, SD not reported)**: Group I: 67.4; Group II: 65.7; Group III: 66.8<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: 4+ weeks after RP; UI (> 2 g urine loss on pad test); neurologically normal; within 2 hours drive of study centre; able to speak and read English<br><br>**Exclusion criteria**: demand pacemaker; previous pelvic muscle stimulation; active rectal lesions or infections; known detrusor instability |
| Interventions | **Group I (n = 18): intensive physiotherapy (PME).** For 30 minutes twice a week for 12 weeks. Four components of muscle function were exercised (strength, endurance, speed, control).<br><br>**Group II (n = 19): electrical stimulation and PME.** Participants met with the same physiotherapist as group I, 30 minutes twice a week. The electrical stimulation was delivered with a surface anal electrode was alternated with PME, carried out in the same way as Group I. Intensity was adequate to induce visual lifting of the levator ani and pubococcygeus muscle. Stimulation parameters were 50 Hz, biphasic pulse shape with 1-s bursts, a 1-s pulse width and 1-s pulse trains<br><br>**Group III (n = 21): no treatment (verbal and written instruction only).** The usual instructions to conduct PME after RP, which included simple written and brief verbal instructions on PME by both the nurses in the pre-admission clinic and the patient's urologist at postoperative visits. no further contact with investigators until follow-up visits |
| Outcomes | **Primary outcomes**<br><br>• **Urine loss:** assessed using 24-hour pad test<br>• **Number of incontinent episodes:** continence defined as loss of 2 g or less of urine; socially acceptable continence defined as 10 g or less of urine lost<br>• **Number of pads used**<br><br>**Secondary outcomes**<br><br>• **Objective quality of life:** measured using IIQ-7, EORTC QLQ C-30. IIQ-7 ranges from 0 to 100, with 0 meaning no impact and 100 meaning significant impact of incontinence. EORTC QLQ C-30 measured using a four-point Likert scale for 28 items and two questions on health and QoL (where 1 = very poor and 7 = excellent) |
| Notes | **Conflicts of interest**: Quote: "In 1998, Dr Moore was a Leverhulme Trust postdoctoral fellow at King's College London" |

**Moore 1999a** *(Continued)*

**Study funding sources**: "Dr Moore's studies were funded for 4 years by a Doctoral Fellowship from the Kidney Foundation of Canada. 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 Edmonton, Canada"

**ITT analysis**: no

**Follow-up time points**: 12, 16 and 24 weeks

**Timing of assessment:** post-randomisation. Quote: "Data were obtained at baseline, and again at 12, 16 and 24 weeks after enrolment."

**Timing of randomisation**: 8 or more weeks after RRP

**UI mentioned in inclusion criteria**: yes

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "Patients were randomized, using a computer-generated random-number list placed in sealed envelopes, by the researcher at the end of the assessment visit, with patient and researcher opening the sealed envelope"<br><br>Comment: seems adequate |
| Allocation concealment (selection bias) | Low risk | Quote: "Patients were randomized, using a computer-generated random-number list placed in sealed envelopes, by the researcher at the end of the assessment visit, with patient and researcher opening the sealed envelope"<br><br>Comment: seems adequate |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Patients would not have been able to have been blinded to the intervention they were receiving as the control group did not receive treatment and treatment arms were different; no other blinding mentioned |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | Quote: "All eligible patients agreed to participate; five were dropped (three in Group 3 and two in group 2, three because of bladder neck contractures, one because of rectal pain when he did the exercises, and one because he went on vacation for 4 months and could not continue therapy)"<br><br>Comment: reasons for dropouts adequately described. Although no dropouts in control group, dropouts in other groups minimal |
| Selective reporting (reporting bias) | High risk | Full data has only been presented for the 24 hour test; the remaining outcome measures have only been described narratively, with P values and Pearson's correlations only. |
| Other bias | High risk | Quote: "Previous surgical procedures included coronary artery bypass surgery in four (7%), TURP in four, TURBT in one, and unrelated surgery in four"<br><br>Quote: "Preoperative LUTS of >3 months duration were reported by 30 of 56 patients"<br><br>Comment: Although the study authors explain the amount of urine loss across the groups, the fact that many of the men already had LUTS issues before the study may potentially have an impact on the results; it is not explained |

**Moore 1999a** *(Continued)*

| | |
|---|---|
| | how these men were distributed across the 3 groups. Additionally, time since surgery across the three groups was different at baseline. |

**Moore 2008**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: 2002 to 2004 |
| Participants | **Number of participants randomised**: 205<br><br>**Country**: Canada<br><br>**Setting**: multicentre (quote: "three academic Canadian urology centres")<br><br>**Reason for undergoing prostate surgery**: clinically localised PCa<br><br>**Type of prostate surgery undertaken**: RRP<br><br>**Type of UI**: NR<br><br>**Participants' age**: NR<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: English- or French-speaking men' booked for RRP; could attend weekly PFMT sessions or maintain weekly contact with research nurse<br><br>**Exclusion criteria**: living more than 2 hours' driving distance from a study centre; having a medical condition that could affect bladder function |
| Interventions | **Group I (n = 106): PFMT and biofeedback.** Participants received a booklet on recovery after RP, which included a simple description of PFMT. Each session of biofeedback (InCare, Aurora, Ontario, Canada) lasted for 30 minutes once per week with a physiotherapist with expertise in continence treatment. Four components of muscle function were worked on: strength, endurance, speed and control. Particpiants were also instructed to perform a penile lift by quote: "contracting the bulbocavernous muscle and to watch for a visible dip at the angle at the base of the penis". All aspects were repeated three times daily at home on non-treatment days, as per a sheet on PFMT.<br><br>**Group II (n = 99): standard treatment (written instruction).** Partipiants received a booklet on recovery after RP, which included a simple description of PFMT. |
| Outcomes | **Primary outcome**<br><br>• **Grams of urine loss:** assessed by the 24-hour pad test quote: "with special emphasis on the 12-week results"<br><br>**Secondary outcomes**<br><br>• **IPSS score:** 7-item questionnaire on urinary symptoms with an eighth item about QoL. Each item is scored 0-5, with 5 being highly symptomatic. Summary score is ranged from 0-35: 0-7 is mildly, 8-19 is moderately and 20-35 is severely symptomatic. Single QoL question asks about living with current symptoms, ranging from "delighted" (0) to "terrible" (6)<br>• **IIQ-7:** 7 questions on the impact of UI on QoL. Single score ranges from 0 ("not at all") to 100 ("a great deal")<br>• **Perception of urine loss:** assessed using a tool designed for the study and pilot-tested on men who had undergone RRP. 1 = not at all problematic, 2 = somewhat problematic, 3 = very problematic |

**Moore 2008** *(Continued)*

- **Economic considerations:** takes into consideration physiotherapist costs, treatment costs, time off work, time lost because of incontinence and number and cost of pads

Notes

**Conflicts of interest**: NR

**Study funding sources**: Quote:"Funded by the Alberta Heritage Foundation for Medical Research, the Northern Alberta Urology Foundation, and Pfizer Corporation (unrestricted)."

**ITT analysis**: yes

**Follow-up time points**: 8, 12, 16, 28 and 52 weeks

**Timing of assessment:** postoperative. Study flow diagram notes that participants were allocated to intervention or control at 4 weeks postoperatively, while follow-up began at 8 weeks postoperative.

**Timing of randomisation**: 4 weeks postoperatively

**UI mentioned in inclusion criteria**: no

**Correspondence with study authors:** we contacted the lead study author to clarify data and blinding on 24 January 2022. Data were unavailable but the author clarified the blinding of outcome assessment.

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "A computer-generated random list of group assignments was prepared and was blocked with a random block size, to reduce the possibility of guessing the next assignment"<br><br>Comment: seems adequate |
| Allocation concealment (selection bias) | Low risk | Quote: "Assignment was placed in numbered opaque envelopes and sealed. Envelopes were opened by an individual not directly involved with the study."<br><br>Comment: seems adequate |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Quote: "Therapists were blinded to the outcomes of the control participants. It was not possible to blind participants to the treatment or control arm."<br><br>Comment: participants could not be blinded |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Low risk | Personal communication: "I can say that the therapists did not have access to the outcomes -- data entry was done by a paid staff member who had no connection with the study results."<br><br>Comment: seems adequate |
| Incomplete outcome data (attrition bias)<br>All outcomes | High risk | Quote: " Complete data to 52 weeks were available on 166."<br><br>Comment: 89/106 in intervention group and 77/99 in control group were analysed at the end of the study. Reasons for dropouts are explained in the flow diagram. Greater dropout in control group than in intervention group. |
| Selective reporting (reporting bias) | High risk | Full data have only been presented for the 24-hour test; the remaining outcome measures have only been described narratively, with mean and median scores for certain time points |

**Moore 2008** *(Continued)*

| | | |
|---|---|---|
| Other bias | Unclear risk | Only baseline information is quote: "There were no important differences between the control and treatment groups on any baseline measures" and PSA level for the whole cohort. |

**Morihiro 2011**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br>**Dates study conducted**: July 2008 to June 2009 |
| Participants | **Number of participants randomised**: 34<br>**Country**: Japan<br>**Setting**: NR<br>**Reason for undergoing prostate surgery**: NR but likely PCa<br>**Type of prostate surgery undertaken**: laparoscopic RP<br>**Type of UI**: NR<br>**Participants' age**: NR<br>**Participants' BMI**: NR<br>**Inclusion criteria**: underwent laparoscopic radical prostatectomy (LRP) by a single surgeon<br>**Exclusion criteria**: NR |
| Interventions | **Group I (n = 20): PFMT + sacral surface therapeutic electrical stimulation (ssTES).** Participants performed ssTES twice daily for 15 minutes for a duration of a month after urethral catheter removal (day 5). No further details about the PFMT.<br>**Group II (n = 14): PFMT.** Participants undertook PFMT alone "soon after the LRP" |
| Outcomes | **Urinary continence:** defined as not requiring a pad to keep their clothing dry |
| Notes | **Conflicts of interest**: NR<br>**Study funding sources**: "none"<br>**ITT analysis**: NR<br>**Follow-up time points**: 1, 3, 6 and 12 months<br>**Timing of assessment:** postoperative. Quote: "[…] evaluated between these two groups at 1, 3, 6 and 12months postoperatively."<br>**Timing of randomisation**: Unclear - Quote: "After surgery, the patients were randomly assigned to two treatment groups for urinary continence"<br>**UI mentioned in inclusion criteria**: no |

| ***Risk of bias*** | | |
|---|---|---|
| **Bias** | **Authors' judgement** | **Support for judgement** |

**Morihiro 2011** *(Continued)*

| | | |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "randomly assigned"<br>Comment: no other details |
| Allocation concealment (selection bias) | Unclear risk | Not reported |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Would have been impossible to blind participants as to whether they were in the PFMT or PFMT plus electrical stimulation group. Blinding of personnel not reported. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |
| Incomplete outcome data (attrition bias)<br>All outcomes | Unclear risk | Not reported |
| Selective reporting (reporting bias) | High risk | Abstract states that the study was not registered in a public clinical trials registry. Methods state that the outcome measures were to be taken at 1, 3, 6 and 12 months postoperatively but only 6 and 12 months reported in the results. |
| Other bias | Unclear risk | Abstract only - not enough information to be able to tell. |

**Pedriali 2016**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: multi-arm RCT<br>**Dates study conducted**: March 2012 and March 2013 |
| Participants | **Number of participants randomised**: 90<br>**Country**: Brazil<br>**Setting**: single centre ("a single teaching hospital")<br>**Reason for undergoing prostate surgery**: prostate cancer<br>**Type of prostate surgery undertaken**: RP<br>• Video laparoscopic surgery: Group I (n = 26): 18 (69%); Group II (n = 28): 15 (54%); Group III: 13 (42%)<br>• Open surgery: Group I (n = 26): 8 (31%); Group II (n = 28): 13 (46%); Group III: 18 (58%)<br>• Bilateral neurovascular bundles preserved: Group I (n = 26): 13 (50%); Group II (n = 28): 12 (43%); Group III: 16 (51%)<br>**Type of UI**:<br>• SUI: Group I (n = 26): 19 (73.1%); Group II (n = 28): 22 (78.6%); Group III: 27 (87.1%)<br>• UUI: Group I (n = 26): 1 (3.8%); Group II (n = 28): 1 (3.6%); Group III: 1 (3.2%)<br>• MUI: Group I (n = 26): 6 (23.1%); Group II (n = 28): 5 (17.8%); Group III: 3 (9.7%)<br>**Participants' age**: Group I (n = 26): 66.07 ± 5.77; Group II (n = 28): 66.32 ± 5.48; Group III: 62.61 ± 7.26<br>**Participants' BMI**: NR |

**Pedriali 2016** *(Continued)*

| | |
|---|---|
| | **Inclusion criteria**: aged between 50 and 75 years; underwent RP at a single teaching hospital; complaint of post-prostatectomy UI (defined as use or one or more pads per day, considering occasional use)<br><br>**Exclusion criteria**: preoperative UI; previous TURP; diagnosis of neurological or cognitive impairment; UTI; inability to attend treatment sessions due to distance or physical limitations |
| Interventions | **Group I (n = 28): Pilates.** 10 sessions of Pilates mat exercises, in pairs, once a week, for 45 minutes. They also received written instructions on how to perform three exercises and two of the Pilates session at home every day<br><br>**Group II (n = 31): PFMT + electrical stimulation.** 10 weekly individual sessions of PFME and AES using the Dualpex 961 Uro with intracavity electrode, once per week, for 40-50 minutes. In case of SUI, participants underwent AES with a current of 50 Hz for 20 minutes (higher frequency) followed by guided PFME (three series of 10 maximal contractions in supine, seated, and standing positions). For those with UUI, the electrical parameters were set at 4 Hz for 20 minutes (lower frequency), followed by the same series of PFME. Those with MUI received both the higher and lower frequencies and the same series of exercises. Participants did not perform voluntary contractions when undergoing the AES and were guided by specialized physiotherapists. They received written instructions to perform the same PFME protocol at home every day.<br><br>**Group III (n = 31):** control. Went through baseline assessment and did not receive treatment or instructions to perform exercises at home.<br><br>**NB:** in the full-text report, it is stated that "During baseline intervention, all patients were taught to contract the PFM with an intracavity pressure sensor (biofeedback)". |
| Outcomes | **Primary outcomes**<br><br>• Mean reduction of daily pads<br>• Mean reduction of ICIQ-SF score<br><br>**Secondary outcome**<br><br>• Mean reduction of UI: assessed using 24-hour pad test |
| Notes | **Conflicts of interest**: "Nothing to disclose"<br><br>**Study funding sources**: NR<br><br>**ITT analysis**: NR but assumed PP<br><br>**Follow-up time points**: 12 weeks (confirmed by communication with study authors)<br><br>**Timing of assessment:** unclear. Interventions carried out for 10 weeks and 12 week follow-up but unclear if this is 12 weeks from randomisation or from intervention start.<br><br>**Timing of randomisation**: after catheter removal (baseline assessment took place 4 weeks postoperatively)<br><br>**UI mentioned in inclusion criteria**: yes<br><br>**Communication with study authors:** we contacted the study authors to confirm whether the follow-up time in the study was 12 weeks or 4 months. Correspondence on 14 April 2022 confirmed that the outcome measures were taken at 12 weeks. As all participants had received some training in PFMT before intervention began, we also contacted the study authors on 10 May 2022 to clarify whether the Pilates group and Control group also undertook PFMT during the study period. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|

**Pedriali 2016** *(Continued)*

| | | |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "Patients were randomized by sealed envelopes method into three treatment groups"<br><br>Comment: unclear how the sequence was generated |
| Allocation concealment (selection bias) | Low risk | Quote: "Patients were randomized by sealed envelopes method into three treatment groups"<br><br>Comment: probably adequate |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Quote: "A single specialist continence physiotherapist, who was blinded to G2 protocol and G2 outcomes, guided these exercises."<br><br>Quote: "Another specialist continence physiotherapist, who was blinded to G1 protocol and G1 outcomes, delivered G2 treatment sessions"<br><br>Quote: "During electrical stimulation the patients did not perform voluntary contractions and were supervised and guided by specialized physiotherapists, who were blinded to G1 protocol and G1 outcomes"<br><br>Comment: personnel appear to be adequately blinded, however participant blinding is not mentioned in the text and it is unlikely that the participants would be blinded due to the nature of the interventions; no sham. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Low risk | Quote: "An independent researcher, who was blinded to the patient's treatment group, performed baseline and final assessments, as well as data collection"<br><br>Comment: seems adequately blinded |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | 26/28 in the Pilates group, 28/31 in the PFMT and stimulation group and 31/31 in the control group were available and analysed at the end of the study. Reasons for losses to follow-up are adequately described in the study flow diagram. No real differential loss to follow up and overall attrition low. |
| Selective reporting (reporting bias) | Unclear risk | The trial was prospectively registered. All of the outcomes in the trial registration have been reported in the main text. However, there are inconsistencies in reporting. Nocturia is mentioned in the trial registration but not reported in the methods of the full report, although results for nocturia are presented. |
| Other bias | Low risk | Nothing to suggest any other sources of bias. |

**Robinson 2009**

| | |
|---|---|
| ***Study characteristics*** | |
| Methods | **Study design**: multi-arm RCT<br><br>**Dates study conducted**: NR |
| Participants | **Number of participants randomised**: 54<br><br>**Country**: USA<br><br>**Setting**: single centre ("an academic medical centre")<br><br>**Reason for undergoing prostate surgery**: NR in text, but likely PCa<br><br>**Type of prostate surgery undertaken**: RP (70.4% had robotic RP) |

**Robinson 2009** *(Continued)*

| | |
|---|---|
| | **Type of UI**: NR<br><br>**Participants' age (mean, SD)**: Group I: 60.6 ± 6.0; Group II: 59.2 ± 6.8; Group III: 58.6 ± 6.4; Total: 59.5 ± 6.3<br><br>**Participants' BMI**: Total 28.5 ± 4.0 (range 20.5-38.7)<br><br>**Inclusion criteria**: lived within 50 miles of the study site; English-speaking; aged 50+ years; recovering from recent RP; newly incontinent of urine (any amount)<br><br>**Exclusion criteria**: NR |
| Interventions | **Group I (n = 17): basic PFT.** Received routine brief verbal and written post-operative instructions to perform PFME. One additional PFT session and three weekly phone calls from a trained nurse, which aimed to reduce the uncertainties of the UI symptom experience and build PFME self-efficacy<br><br>**Group II (n = 17): enhanced PFT (PFMT and biofeedback).** Received routine brief verbal and written post-operative instructions to perform PFME. Four additional biofeedback-enhanced PFMT sessions and four weekly phone calls from the nurse toward the same goal as the basic PFT group<br><br>**Group III (n = 17): usual PFT (written and verbal instruction).** Received routine brief verbal and written post-operative instructions to perform PFME from their clinician at the study site but no further instruction |
| Outcomes | • **Pelvic floor muscle strength:** assessed using urine stream interruption test<br>• **Uncertainty in illness:** assessed using the Mishel Uncertainty in Illness scale<br>• **PFME self-efficacy:** assessed using the Broome Pelvic Muscle Self-Efficacy Scale<br>• **UI frequency:** assessed using 3-day bladder diary<br>• **UI volume:** assessed using 24-hour pad testUI distress: assessed using the Male Urogenital Distress Inventory<br>• **Quality of life:** assessed using the Male Urinary Symptom Impact Questionnaire |
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: "NIH/NINR (#1 K23 NR008220-01A2)"<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 3, 6 and 9 months<br><br>**Timing of assessment:** postoperative. Quote: "Schedule: Post-op months 1 (baseline), 3, 6, & 9"<br><br>**Timing of randomisation**: post-catheter removal ("recovering from recent RP" and needed a diagnosis of UI)<br><br>**UI mentioned in inclusion criteria**: yes<br><br>**Correspondence with study authors:** personal communication with the study authors on 9 December 2021 confirmed that Robinson 2008 and Robinson 2009 are separate studies. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "randomly assigned via sealed envelope technique"<br><br>Comment: unclear whether the envelopes were opaque and whether this actually refers to allocation concealment |
| Allocation concealment (selection bias) | Low risk | Quote: "randomly assigned via sealed envelope technique" |

**Robinson 2009** *(Continued)*

| | | |
|---|---|---|
| | | Comment: seems adequate |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Patients would not have been able to have been blinded to the intervention they were receiving as the control group did not receive PFMT; no other blinding mentioned |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |
| Incomplete outcome data (attrition bias)<br>All outcomes | High risk | Data available for limited number of the original patients (54). 32 for PFM Strength, 36 for UI Volume |
| Selective reporting (reporting bias) | Low risk | The outcome measures stated in the methods appear to be reported. |
| Other bias | Unclear risk | Abstract and poster only - not enough information to be able to tell |

**Sanchez-Salas 2021**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design:** multi-arm RCT<br>**Dates study conducted:** 2015 to 2018 |
| Participants | **Number of participants randomised:** 240<br>**Country:** France<br>**Setting:** NR<br>**Reason for undergoing prostate surgery:** NR in text, but likely PCa<br>**Type of prostate surgery undertaken:** RARP<br>**Type of UI:** NR<br>**Participants' age:** NR<br>**Participants' BMI:** NR<br>**Inclusion criteria:** men who had experienced UI after RARP<br>**Exclusion criteria:** NR |
| Interventions | **Group I (n = 60): PFMT + biofeedback.** Consisted of pelvic muscle contractions conducted with electromyographic feedback weekly for 3 months.<br>**Group II (n = 60): Duloxetine.** Participants took 60 mg oral duloxetine at bedtime for 3 months.<br>**Group III (n = 60): PFMT + biofeedback + duloxetine.** Participants in this group performed PFMT as per Group I and duloxetine as per Group II.<br>**Group IV (n = 60): instructions for PFMT.** From correspondence with study authors: "Patients in the control group were instructed about pelvic muscle contractions at home after the catheter removal". |
| Outcomes | **Primary outcome** |

**Sanchez-Salas 2021** *(Continued)*

- **Continence:** defined as no leakage on a 3-day 24-hour pad test

**Secondary outcomes**

- **Quality of life:** assessed using a VAS and the KHQ
- **Urinary symptoms:** assessed using the IPSS
- **Erectile dysfunction:** assessed using the IIEF-5

Notes

**Conflicts of interest:** NR

**Study funding sources:** Quote: "This research received no specific grant from any source of funding"

**ITT analysis:** NR

**Follow-up time points:** 1, 3, 6 and 12 months

**Timing of assessment:** postoperative. Quote: "1, 3, 6 and 12months post-RARP"

**Timing of randomisation:** after catheter removal

**UI mentioned in inclusion criteria:** yes

**Correspondence with study authors:** We contacted the study authors on 25 May 2022 and 2 June 2022 to enquire about the numbers of participants still remaining in the study at 12 months, the nature of the control arm and to clarify details surrounding data reported in the abstracts. We received a response that helped clarify the control arm and attrition rate of the study.

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "We conducted a prospective, randomized controlled trial"<br>Comment: method of randomisation unclear |
| Allocation concealment (selection bias) | Unclear risk | Not reported |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Not reported, but participants would not have been able to have been blinded to the treatment that they were receiving in the study due to the nature of the interventions. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | Quote: "Overall, 89% of patients completed 1 year of follow-up".<br>Comment: From correspondence with authors, 55/60 in the PFMT group, 55/60 in the Duloxetine group, 52/60 in the PFMT plus duloxetine group and 52/60 in the control group completed the study. Overall attrition low and no large differential attrition between groups. |
| Selective reporting (reporting bias) | Unclear risk | Outcomes in the trial registration appear to be acknowledged and reported in the abstract. However, erectile dysfunction is reported in one abstract and is not mentioned in the trial registration. Unclear rationale for the post-hoc analysis. |
| Other bias | Unclear risk | Abstract only - not enough information to be able to tell. |

### Sangalli 2021

| *Study characteristics* | |
|---|---|
| Methods | **Study design:** RCT<br><br>**Dates study conducted:** March 2018 to March 2019 |
| Participants | **Number of participants randomised:** 100<br><br>**Country:** Italy<br><br>**Setting:** NR<br><br>**Reason for undergoing prostate surgery:** prostate cancer<br><br>**Type of prostate surgery undertaken:** RARP<br><br>**Type of UI:** NR<br><br>**Participants' age:** NR<br><br>**Participants' BMI:** NR<br><br>**Inclusion criteria:** men who had undergone RARP for PCa<br><br>**Exclusion criteria:** NR |
| Interventions | **Group I (n = NR): rTPM.** Quote: "a passive training program based on electromagnetic stimulation of pelvic floor muscle groups and give a better response ratio from usually inactive muscle fibres and quickens reflex response". Each participant was trained in PME after catheter removal and then scheduled for 8 consecutive weeks of twice-weekly rTPM, for a total of 16 sessions, from one month after RARP. Quote: "The technology used in the training is certified in the EU as a class 2b CE medical device."<br><br>**Group II (n = NR): PME.** Participants were trained in PME after removal of the catheter. |
| Outcomes | **Urinary incontinence:** as assessed by the ICIQ-SF and 24-hour pad weight test |
| Notes | **Conflicts of interest:** NR<br><br>**Study funding sources:** "None"<br><br>**ITT analysis:** NR<br><br>**Follow-up time points:** 1, 2, 3, 6 and 12 months<br><br>**Timing of assessment:** postoperative. Quote: "All patients were required to fill the Short Form ICIQ-SF questionnaire and the 24-hours pad weight test at 1, 2, 3, 6 and 12 months after surgery and were scheduled for outpatient clinic evaluations."<br><br>**Timing of randomisation:** after catheter removal - "after removal of catheter and 1 month after RARP"<br><br>**UI mentioned in inclusion criteria:** no<br><br>**Correspondence with study authors:** we contacted the study authors on 25 May 2022 and 2 June 2022 to ask for further details on how many participants in each arm, how many completed at each time point and whether the data for the continence rate described in the abstract was measured using the ICIQ-SF or 24-hour pad test. We did not receive a response. |
| *Risk of bias* | |

**Sangalli 2021** *(Continued)*

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | Quote: "randomly assigned"<br>Comment: method of randomisation unclear |
| Allocation concealment (selection bias) | Unclear risk | Not reported |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Not reported, but participants would not have been able to have been blinded to the treatment that they were receiving in the study due to the nature of the interventions. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported |
| Incomplete outcome data (attrition bias)<br>All outcomes | Unclear risk | Although states "3 (16%) patients in rTPM Group dropped out for severe pelvic pain.", it Is unclear if any participants from the control group withdrew. Also unclear if ITT analysis was used. |
| Selective reporting (reporting bias) | Unclear risk | No trial registration mentioned. Not possible to assess whether outcomes reported were planned in the registration. |
| Other bias | Unclear risk | Abstract only - not enough information to be able to tell. |

**Serdà 2014**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br>**Dates study conducted**: October 2007 and October 2008 |
| Participants | **Number of participants randomised**: 69<br>**Country**: Spain<br>**Setting**: single centre (Hospital of Figueres)<br>**Reason for undergoing prostate surgery**: PCa<br>**Type of prostate surgery undertaken**: NR<br>• Number undergoing surgical treatment alone: Group I (n = 33): 20; Group II: 19<br>• Number undergoing surgical treatment and androgen deprivation therapy: Group I (n = 33): 9; Group II: 7<br>• Number undergoing radiotherapy and androgen deprivation therapy: Group I (n = 33): 9; Group II: 7<br>**Type of UI**:<br>• SUI: Group I (n = 33): 33.33%; Group II: 36.36%<br>• UUI: Group I (n = 33): 15.15%; Group II: 24.24%<br>• MUI: Group I (n = 33): 18.18%; Group II: 12.12%<br>• LUTS with a pattern of MUI and/or nocturia, not diagnosed with UI: Group I (n = 33): 33.33%; Group II: 27.27% |

**Serdà 2014** *(Continued)*

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|---|---|
| | **Participants' age**: Group I (n = 33): 71.09 ± 8.10 (range 50-83); Group II: 71.78 ± 6.82 (range 56-86)<br><br>**Participants' BMI**: Group I (n = 33): 28.67 ± 2.99 (range 23.39 to 34.64); Group II: 27.43 ± 2.10 (range 24.09 to 32.67)<br><br>**Inclusion criteria**: to have a histological diagnosis of prostate cancer (any stage of disease); passed a pre-intervention medical examination where it is declared that the patient shows none of the counter-indications incompatible with the program; have undergone either prostatectomy alone, prostatectomy with hormonal treatment or radiotherapy combined with hormonal treatment; signed an informed consent form<br><br>**Exclusion criteria**: not to have suffered from UI before diagnosis of disease; inability to understand or speak Spanish |
| Interventions | **Group I (n = 36): PFMT.** Undertaken over 24 weeks and linking three consecutive phases of recognition, control and toning of the pelvic floor muscles. Stage one included global postural re-education to achieve a vertical and balanced global posture. Stage two included the PFMT, consisting of identifying the affected area to be rehabilitated through proprioceptive activity, dissociating surrounding healthy muscles, recovering the condition of the muscular fibres to achieve effective contraction and restoring co-ordinated muscular synergy. The third stage was "to radiate muscular strength" by expanding PFMT through contraction of the well-conditioned healthy muscle that is further away from the pelvic floor. The program included 16 weeks of direct control by rehabilitation personnel and 8 weeks of autonomous exercise. Two sessions were held per week, each lasting 60 minutes.<br><br>**Group II (n = 33): control.** Watchful waiting (telephone contact; no other details) |
| Outcomes | • **Intensity and frequency of leakage:** assessed using Sandvik scale<br>• **Volume:** assessed by 20 minute nappy test (correlates to 1-hour pad test)<br>• **Urinary incontinence:** measured by VAS scale<br>• **Nocturia:** defined as the need to get up twice or more during the night<br>• **Quality of life:** assessed using the Functional Assessment Cancer Therapy Scale-Prostate (FACT-P), ranging from 0-156 and including 27 general questions as well as 12 questions specifically about prostate cancer and its treatment<br>• **Waist perimeter:** measured midway between the lower costal margin and the iliac crest at the end of expiration<br>• **Obesity:** categorised on the basis of waist perimeter and classified into either not obese (corresponding to a measurement of 100 cm or less) and obese (measurement of > 100 cm) |
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: NR<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 24 weeks<br><br>**Timing of assessment:** post-randomisation. Study flow diagram notes that the data collection took place 24 weeks after randomisation.<br><br>**Timing of randomisation**: variable and unclear, given the different types of treatment undertaken for PCa<br><br>**UI mentioned in inclusion criteria**: no; also included participants who received other forms of therapy<br><br>**Correspondence with study authors:** we contacted the study authors on 14 March 2022 and again on 12 April 2022 to request any separated data for those men who had undertaken prostate surgery. We did not receive a response. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|

**Serdà 2014** *(Continued)*

| | | |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "randomized into an experimental group (EG) and a control group (CG)."<br><br>Comment: randomised on the basis of medical records numbers using SPSS v.15 |
| Allocation concealment (selection bias) | Unclear risk | Not reported. |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Would have been impossible to blind participants as to whether they were in the PFMT or watchful waiting group; blinding of personnel not mentioned. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported. |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | 33/36 in PFMT group and 33/33 in control group completed study. No major differential loss to follow-up or losses to follow up overall. Reasons for dropouts explained in study flow diagram. |
| Selective reporting (reporting bias) | High risk | The study authors noted that they would use the Sandvik Scale to assess frequency and intensity of UI but this does not appear to be reported. They also noted in the methods that they would measure nocturia, but this does not appear to be reported. |
| Other bias | Low risk | No other sources of bias identified. |

**Strojek 2021**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: November 2018 to September 2019 |
| Participants | **Number of participants randomised**: 37<br><br>**Country**: Poland<br><br>**Setting**: NR<br><br>**Reason for undergoing prostate surgery**: PCa<br><br>**Type of prostate surgery undertaken**: laparoscopic RP<br><br>**Type of UI**: SUI<br><br>**Participants' age**: Group I: 61.4 ± 7.4; Group II: 64.2 ± 4.5 (n = 15)<br><br>**Participants' BMI**: Group I: 26.2 ± 3.0; Group II: 26.8 ± 2.7 (n = 15)<br><br>**Inclusion criteria**: patients after laparoscopic radical prostatectomy; SUI diagnosed by a urologist and based on urodynamic examination results; recent therapeutic interventions in pelvic floor performed within 6 months prior to the study (PFMT, magnetotherapy, electrostimulation, biofeedback); no contraindications to treatment; written consent to study |

**Strojek 2021** *(Continued)*

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|---|---|
| | **Exclusion criteria**: perineal surgery; robot-assisted surgery using the Da Vinci system or TURP; surgical and post-surgical complications disallowing early intervention with physiotherapy (damage to the external sphincter, urinary system infection, bladder neck stenosis); detrusor muslce overactivity; no incontinence following surgery; UI before the surgery; active malignancy |
| Interventions | **Group I (n = 19): PFMT.** 24 individual sessions of physiotherapist-guided PFMT (twice weekly over 3 months) two weeks following the surgery. Exercises conducted in hospital rehabilitation department. Prior to the intervention, each participant underwent postural correction. Sacroiliac joints and sacrolumbar joints were mobilised and participants were taught thoracic and abdominal respiration. Once completed, the participants undertook PFMT by activating fast-twitch fibres and slow-twitch fibres with co-contraction of the transverse abdominal muscle. They performed the PFMT in standing, supine and sitting positions. The number of exercise sets and contraction time were adjusted individually for each participant and their functional activity.<br><br>**Group II (n = 18): no intervention.** Recieved no intervention. No other details provided. |
| Outcomes | • **Myostatin concentration:** assessed by collecting six mL of blood; Myostatin concentration determined quantitatively by examining plasma and serum samples<br>• **Health-related quality of life:** assessed using the shortened 26-item Expanded Prostate Cancer Index Composite instrument (EPIC-26). It contains 26 items within five sub-domains (incontinence subscale, irritation/obstruction subscale, bowel symptom, sexual symptom, vitality or hormonal symptom, overall urinary difficulties). Higher scores equal a better quality of life.<br>• **Depression severity:** measured using the Beck's Depression Inventory-II (BDI-II). Consists of 21 items, self-scored by patients on a scale of 0-3, where 0 is no symptoms and 3 is severe symptoms. 0-8 equals no depression, 9-18 is moderate depression and 18+ points is severe depression |
| Notes | **Conflicts of interest**: Quote: "The authors report no conflict of interest in this work"<br><br>**Study funding sources**: "This research received no external funding"<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 12 weeks<br><br>**Timing of assessment:** post-randomisation. Study flow diagram appears to suggest that the timing of assessment was 12 weeks following randomisation and allocation.<br><br>**Timing of randomisation**: after catheter removal - inclusion criteria required a urodynamic assessment of SUI and exclusion criteria included no UI after surgery<br><br>**UI mentioned in inclusion criteria**: yes<br><br>**Correspondence with study authors:** we contacted the study authors on 23 February 2022 and again on 14 March 2022 to enquire as to whether the data in Table 3 of the manuscript represented change scores or final scores. We did not receive a response. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "Stratified randomization was ensured by applying a simple subject allocation method.<br>During the group allocation process, a blinded investigator picked a number from a<br>computer-generated table."<br><br>Comment: seems adequate |
| Allocation concealment (selection bias) | Low risk | Quote: "Each number was assigned to an envelope containing information on group allocation" |

**Strojek 2021** *(Continued)*

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| | | Comment: probably adequate |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Would have been impossible to blind participants as to whether they were in the PFMT or no exercise group; blinding of personnel not mentioned. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Not reported. |
| Incomplete outcome data (attrition bias)<br>All outcomes | High risk | No dropouts or losses to follow up in PFMT group; 15/18 followed up in control group. Some differential dropout here and reasons for losses to follow-up do not appear to be explained. |
| Selective reporting (reporting bias) | High risk | Does not appear to have been prospectively or retrospectively registered so cannot tell whether the outcomes were predefined. Additionally, does not report on either a subjective or objective measure of UI. |
| Other bias | Low risk | Nothing to suggest any other sources of bias. |

**Van Kampen 2000**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br>**Dates study conducted**: January 1995 to June 1996 |
| Participants | **Number of participants randomised**: 102<br>**Country**: Belgium<br>**Setting**: single centre ("at our Hospital")<br>**Reason for undergoing prostate surgery**: clinically-localised prostate cancer<br>**Type of prostate surgery undertaken**: RRP<br>• One bundle of nerve sparing: Group I: 9 (18%); Group II: 2 (6%)<br>• Two bundles of nerve sparing: Group I: 0; Group II: 2 (4%)<br>• Previous transurethral resection: Group I: 2 (4%); Group I: 5 (10%)<br>**Type of UI**: NR<br>**Participants' age (years)**: Total: 65 (range 52-76); Group I: 64.35 ± 0.81; Group II: 66.58 ± 0.80<br>**Participants' BMI**: NR<br>**Inclusion criteria**: incontinent at day 15 after surgery and removal of the catheter; patient could regularly attend hospital appointments<br>**Exclusion criteria**: NR |
| Interventions | **Group I (n = 50): PFMT + biofeedback, plus electrical stimulation for 7/50 participants.** Patients in the treatment group took part in a pelvic-floor reeducation programme for as long as any degree of incontinence persisted, with a time limit of 1 year. Each patient received individual treatment in an outpatient clinic once a week. During the first treatment session the anatomy and function of the pelvic floor and bladder were explained. The training programme involved active pelvic-floor muscle exer- |

**Van Kampen 2000** *(Continued)*

| | |
|---|---|
| | cises and biofeedback. However, some of the patients initially could not actively contract their pelvic-floor muscles or the contraction was very weak. The strength of the pelvic-floor muscles was measured by digital anal control. A score of 0–5 was given (0 = no contraction, 1 = flicker, 2 = weak contraction, 3 = good contraction but without resistance, 4 = good contraction against slight resistance, 5 = good contraction against strong resistance).<br><br>Seven of 50 patients were not able to contract the pelvic-floor muscles or had only a weak contraction (score 0–2). Those patients were given electrical stimulation with an anal probe to teach them how to contract the muscles. When the patients were able to do the appropriate pelvic-floor muscle activity, they were told to do 90 contractions per day at home in any of three positions—supine, sitting, or standing. Patients were also told how to integrate contractions into daily activities.<br><br>**Group II (n = 52): sham electrical stimulation.** Patients in the control group also attended the outpatient clinic once a week. They were told about the origin of incontinence after radical prostatectomy and received placebo electrotherapy that could not affect the pelvic-floor muscle function. The placebo electrotherapy (a false interferential current) was given via four skin electrodes, two placed on the abdomen and two on the adductor muscles of the thighs. |
| Outcomes | • **Objective incontinence:** assessed by the 24-hour and 1-hour pad test. The 24-hour pad test was conducted every day from the time of catheter withdrawal until the patient was continent. When a loss of < 2 g was achieved, a 1-hour pad test was performed in hospital as an additional assessment to confirm that they were continent. The 1-hour pad test was repeated for all participants 1 year after RP.<br>• **Subjective incontinence:** measured using a VAS ranging from 0 (completely dry) to 10 (completely incontinent). |
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: Quote: "This study was supported by a grant from the Fund of Scientific Research, Flanders, Belgium"<br><br>**ITT analysis**: yes<br><br>**Follow-up time points**: 1 day, 1 week, 1, 2, 3, 4, 5, 6 and 12 months (according to Table 3 in full report)<br><br>**Timing of assessment:** unclear. Quote: "The 1 h pad test was repeated for all patients 1 year after radical prostatectomy." This suggests postoperative, however: quote: "The 24 h pad test was done every day from the time of catheter withdrawal until the patient became continent." This aligns more with the timing of randomisation.<br><br>**Timing of randomisation**: after catheter removal<br><br>**UI mentioned in inclusion criteria**: yes |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "Patients were placed in one of six subgroups according to amount of initial urine loss (three categories: 50 g, 51–249 g, and 250 g), and if they had had a transurethral resection. On day 1 after catheter removal the patients in these six subgroups were randomly assigned by an independent person into the treatment group or the control group. Random permuted blocks were used to generate the randomisation list."<br><br>Comment: adequate method of randomisation |
| Allocation concealment (selection bias) | Low risk | Quote: "Sealed envelopes were chosen to allocate the patients to either the control group or treatment group"<br><br>Comment: adequate method of allocation |

**Van Kampen 2000** *(Continued)*

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|---|---|---|
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Quote: "The patients in both groups were treated by the same therapist (MVK) until they became continent, within a period of 1 year."<br><br>Comment: the therapist was not blinded to the groups. Control Gp received placebo electrotherapy that could not affect the pelvic-floor muscle function. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Low risk | Quote: "All the assessments were done and data collected by a therapist who was not involved with the study"<br><br>Comment: seems adequately blinded |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | 48/50 in the treatment group and 50/52 in the control group completed the study. Reasons for dropout are described in full within the text. No differential attrition between groups and minimal losses to follow-up. |
| Selective reporting (reporting bias) | Low risk | Outcomes stated in the methods appeared to be reported. |
| Other bias | Low risk | A small number of participants had previously undergone TURP, but not enough to impact the results. No other sources of bias detected. |

**Yamanishi 2010**

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|---|---|
| ***Study characteristics*** | |
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: June 2003 to December 2008 |
| Participants | **Number of participants randomised**: 56<br><br>**Country**: Japan<br><br>**Setting**: NR<br><br>**Reason for undergoing prostate surgery**: prostate cancer<br><br>**Type of prostate surgery undertaken**: open RRP<br><br>**Type of UI**: NR<br><br>**Participants' age (years)**: Group I: 65.4 ± 5.6; Group II: 68.0 ± 5.6; Total: 66.6 ± 6.2 (range 50 to 76)<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: UI of more than 200 gm daily; no residual cancer after RRP on pathological examination<br><br>**Exclusion criteria**: treatment with anticholinergics or tricyclic antidepressants; neurological disorders; urethral stricture |
| Interventions | **Group I (n = 26): PFMT + electrical stimulation.** Standard PFMT was taught by nurses using verbal and written instructions and was continued throughout the study with coaching at follow-up visits. Those in the electrical stimulation group received 15 minutes of electrical stimulation twice daily with an anal electrode. 50 Hz square waves with a 300 us pulse duration and a maximum output of 70 mA (5 seconds on, 5 seconds off duty cycle) was used.<br><br>**Group II (n = 30): PFMT + sham stimulation.** Standard PFMT was taught by nurses using verbal and written instructions and was continued throughout the study with coaching at follow-up visits. Sham |

**Yamanishi 2010** *(Continued)*

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|---|---|
| | stimulation was performed with the same system as in the intervention group, but was limited to 3 mA and 2 seconds on, 13 seconds off duty cycle. |
| Outcomes | **Primary outcome**<br>• **Continence rate:** defined as the loss of 8 g or less of urine during the 24-hour pad test<br>**Secondary outcomes**<br>• **Time to continence**<br>• **Urine loss (gm):** assessed during a 24-hour pad test<br>• **Change in ICIQ-SF score:** includes the frequency of leakage on a scale of 0-5, the amount of leakage on a scale of 0-6, and a QoL score using a VAS of 0-10<br>• **Change in KHQ score:** assessed before treatment, at 1 month and at the end of treatment (usually 12 months) |
| Notes | **Conflicts of interest**: NR<br>**Study funding sources**: NR<br>**ITT analysis**: NR<br>**Follow-up time points**: 1, 3, 6 and 12 months; assessment times vary by outcome<br>**Timing of assessment:** unclear. Quote: "The primary efficacy end points were continence rates after 1, 3, 6 and 12 months of treatment." However, unclear when the treatment started (i.e. whether it was immediately post-randomisation or at another time point)<br>**Timing of randomisation**: 1 week after catheter removal - "The urethral catheter was removed at 2 weeks postoperatively, and a 3-day pad test, ICIQ-SF and KHQ were assessed at 1 week after catheter removal."<br>**UI mentioned in inclusion criteria**: yes |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "After registering the patients in the computer system and connecting the stimulation device, the computer randomly assigned each subject to active or sham ES"<br>Comment: seems adequate |
| Allocation concealment (selection bias) | Low risk | Quote: "None of the patients, doctors or medical staff knew which type of stimulation had been assigned until the key code was opened."<br>Comment: seems to suggest blinding of allocation took place |
| Blinding of participants and personnel (performance bias)<br>All outcomes | Unclear risk | Says the study was "double-blind" but it is unclear who was blinded. Possible that as both groups received PFMT and a sham ES was used that participants could have been blinded, but not described in the text. |
| Blinding of outcome assessment (detection bias)<br>All outcomes | Unclear risk | Says the study was "double-blind" but it is unclear who was blinded. Unclear if this refers to outcome assessors. |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | Quote: "In the active ES group 2 patients and in the sham group 4 discontinued the study due to discomfort or anal pain during ES. In the active ES group 2 patients discontinued after 2 and 3 months, respectively, due to urethral stric- |

**Yamanishi 2010** *(Continued)*

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| | | ture 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. Also in the sham group 5 patients complained that ES was not working well enough, but they continued the study up to 12 months of treatment. Finally 47 patients (22 in the active ES group and 25 in the sham group) completed the study."<br><br>Comment: no study slow diagram but reasons for withdrawal from the study are adequately reported narratively. 22/26 in intervention group and 25/30 in the control group completed study. No differential attrition or large attrition overall |
| Selective reporting (reporting bias) | Unclear risk | Outcomes in the methods are reported in the results but there is no mention of a trial registration. Therefore, not able to tell whether there were any deviations from protocol. |
| Other bias | Low risk | Nothing to suggest any other sources of bias. |

**Zaidan de Barros 2014**

| ***Study characteristics*** | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: August 2013 to December 2013 |
| Participants | **Number of participants randomised**: 36<br><br>**Country**: Brazil<br><br>**Setting**: single centre ("in the Pelvic Physical Therapy Clinic of the Federal Hospital of the State Server (HFSE)")<br><br>**Reason for undergoing prostate surgery**: NR but likely PCa<br><br>**Type of prostate surgery undertaken**: RRP<br><br>**Type of UI**: NR<br><br>**Participants' age**: Group I (n = 15): 65.1 ± 8.5; Group II: 65.6 ± 6.4<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: patients with UI by sphincter deficiency with clinical diagnosis from a doctor; resulting from RRP; referred by the urologists of the centre; maximum time post-surgery of 6 months; used 2 to 5 disposable pads per day<br><br>**Exclusion criteria**: symptoms of UTI; symptoms of obstruction of the lower urinary tract; anal fistula; metal implant in the body; TURP; prior radiotherapy; did not perform the proposed treatment |
| Interventions | **Group I (n = 16): PFMT (EMAPs) + electrical stimulation.** Underwent electrostimulation with an endoanal electrode in the lateral decubitus position with hips and knees flexed. The parameters were set to a frequency of 65 Hz, pulse width of 500 US, and biphasic current intensity set according to the tolerance level of the participant. The perineal stimulus time was 4 seconds, standby time of 8 seconds, lasting for 20 minutes. All participants were verbally instructed by the physiotherapist to contract the MAPs during electrical stimulation and relax until the end of the session. "Two minutes immediately after stimulation, these patients were subjected to years of MAPs, the same exercises carried out by the MAPs EMAPs group (active control). total duration of 40 minutes" - unclear what is meant by "years of MAPs" |

**Zaidan de Barros 2014** *(Continued)*

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| | **Group II (n = 20): PFMT (EMAPs) alone.** Supervised exercises were performed by participants following instruction from the physiotherapist. They were instructed to perform diaphragmatic inspiration alongside relaxation of the MAPs, before exhaling slowly alongside the relaxation of the MAPs. The participants were in the lateral decubitus position, with knees and hips flexed, and held two series of 5 maximal contractions of MAPs at intervals of 6 seconds in-between. The physiotherapist checked this using gloved hands inside the anal canal and with the other hand placed on the abdomen. The participants also performed 3 sets of 8 contractions supported by 4/2 of MAPs at intervals of 4 seconds. The participants repeated these exercises while seated in a chair with feet flat on the floor, and standing against a wall with feet parallel and knees semi-flexed. Overall, the protocol took 20 minutes. |
| Outcomes | **Urinary incontinence:** assessed using an interview on urinary symptoms, amount of disposable pads used per day, loss of urine on exertion, and associated pathologies. "The success criteria for achieving continence was the use of any daily disposable protective" |
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: "This study received financial support from the National Council for Scientific and Technological Development (CNPq) through scientific research grant to the author"<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 3 months (confirmed by study authors)<br><br>**Timing of assessment:** unclear, possibly post-randomisation. Quote: "It was considered as the primary outcome urinary incontinence, which was measured before the intervention and after 20 treatment sessions or immediately after patient discharge." Baseline was post-intervention but unclear if the timing was post-randomisation.<br><br>**Timing of randomisation**: after catheter removal - participants had to be less than 6 months post-surgery and had undergone RRP<br><br>**UI mentioned in inclusion criteria**: yes<br><br>**Correspondence with study authors:** we contacted the study authors on 29 April 2022 to ascertain the time point at which outcomes were measured. Correspondence on 4 May 2022 confirmed that the outcome measures were measured at 3 months. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Quote: "For the random allocation of patients to one of EMAPs and EE + EMAPs groups were used functions = IF (RAND () <0.500001, 1, 2) Microsoft Office Excel® 2005 generated a list of 100 random numbers " 1 or 2". According to the patient order entry in the study, it was awarded the random number "1" or "2" generated by EXCEL. If "1" the patient went to the EMAPs group, "2" the patient went to the EE + EMAPs group."<br><br>Comment: seems adequate |
| Allocation concealment (selection bias) | Unclear risk | Not reported |
| Blinding of participants and personnel (performance bias)<br>All outcomes | High risk | Quote: "double-blind"<br><br>Comment: no details of which two groups were blinded in the study. Would have been impossible to blind participants as to whether they were in the PFMT alone or PFMT + Estim group. Blinding of personnel does not appear to be reported. |
| Blinding of outcome assessment (detection bias) | Unclear risk | Quote: "They were blinded evaluator screening, the evaluator of the primary endpoint and statistical analyst." |

**Zaidan de Barros 2014** *(Continued)*

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|---|---|---|
| All outcomes | | Quote: "The physiotherapist specialist in Pelvic Physical Therapy who applied interventions, did the pre- and post UI. The evaluation was done by another specialist physiotherapist who underwent a two-week standardization of assessment procedures training. Data analysis was blinded"<br><br>Comment: says that data analysis was blinded but also suggests that the physiotherapist who undertook the interventions was involved in data analysis, which suggests data collection was unblinded |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | Quote: "One of the participants belonged to the electrostimulation group more exercises MAPs gave up because he was deep depression. The study was completed with 35 patients who received the planned treatment and were analyzed for the primary and secondary outcomes."<br><br>Comment: only one loss to follow-up, no differential attrition. Overall loss to follow-up minimal and reason for dropout described |
| Selective reporting (reporting bias) | High risk | Prospectively registered. Only urinary incontinence was stated as an outcome measure in the trial registration but PFM strength is also assessed in the abstract. Unclear why this post-hoc analysis was undertaken. Method of assessing urinary incontinence not described in the trial registration. Single outcome measure, no PROMs. |
| Other bias | Low risk | Nothing to suggest any other sources of bias. |

AUA-7: American Urological Index
BFB: biofeedback
BMI: body mass index
EPIC: Expanded Prostate Cancer Index Composite
EORTC QLQ C-30: European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire
ES: electrical stimulation
FACT-P: Functional Assessment Cancer Therapy Scale-Prostate
FI: faecal incontinence
ICIQ-SF: International Consultation on Incontinence Questionnaire Short Form
IIEF-5: International Index of Erectile Function
IIQ-7: Incontinence Impact Questionnaire, Short Form
IPSS: International Prostate Symptom Score
IQR: interquartile range
ITT: intention-to-treat
LRP: laparoscopic radical prostatectomy
NR: not reported
OAB: overactive bladder
PCa: prostate cancer
PFMT: pelvic floor muscle training
PME: pelvic muscle exercises
PPUI: post-prostatectomy urinary incontinence
QoL: quality of life
RARP: Robot Assisted Radical Prostatectomy
RCT: randomised controlled trial
RP: radical prostatectomy
RRP: radical retropubic prostatectomy
SUI: stress urinary incontinence
ssTES: sacral surface therapeutic electrical stimulation
TURP: transurethral resection of prostate
UI: urinary incontinence
UUI: urge urinary incontinence
VAS: visual analogue scale

**Characteristics of excluded studies** *[ordered by study ID]*

| Study | Reason for exclusion |
|---|---|
| Abbinante 2012 | Ineligible study design: not an RCT |
| Abel 1996 | Ineligible population: study in women |
| Allameh 2021 | Ineligible population: preoperative randomisation |
| Amend 2018 | Ineligible comparator: PFMT + biofeedback versus PFMT alone |
| Arruda 2007 | Ineligible population: randomisation occurred before surgery |
| Au 2020 | Ineligible population: randomisation occurred before surgery |
| Aydın Sayilan 2018 | Ineligible intervention: intervention includes acupuncture |
| Azevedo 2020 | Ineligible population: study in women |
| Baroni 2013 | Ineligible comparator: individual vs group approach to rehabilitation |
| Bernier 2008 | Ineligible population: study in women |
| Bourcier 1994 | Ineligible population: study in women |
| Bryant 2001 | Ineligible population: study included all adults, both men and women |
| Burnett 2012 | Ineligible population: preoperative enrolment |
| Ceresoli 1995 | Ineligible study design: not an RCT |
| Feng 2000 | Ineligible intervention: intervention commenced before prostate surgery |
| Feng 2022 | Ineligible comparison: biofeedback-assisted PFMT and transanal electrical stimulation versus (electrical pudendal nerve stimulation |
| Floratos 2002 | Ineligible comparison: PFMT + biofeedback versus PFMT alone |
| Fode 2015 | Ineligible study design: cross-over RCT |
| Franke 1998 | Ineligible population: randomisation occurred before surgery |
| Griebling 1999 | Ineligible intervention: intervention commenced before surgery |
| Heerey 2016 | Ineligible comparison: one type of PFMT versus another type of PFMT |
| Heydenreich 2016 | Ineligible comparison: PFMT and oscillating rod versus PFMT alone. Oscillating rod is not a form of electrical stimulation, so does not fit with comparisons for this review. |
| Heydenreich 2020 | Ineligible comparison: PFMT and oscillating rod versus PFMT alone. Oscillating rod is not a form of electrical stimulation, so does not fit with comparisons for this review. |
| Hsu 2016 | Ineligible study design: systematic review |
| Jackson 1996 | Ineligible study design: not an RCT |

| Study | Reason for exclusion |
|---|---|
| Jalalinia 2020 | Ineligible population: randomisation occurred before surgery |
| Joseph 2000 | Ineligible comparison: PFMT + biofeedback versus PFMT alone |
| Karlsen 2021 | Ineligible patient population: the men in the study have erectile dysfunction; post-prostatectomy incontinence not an inclusion criteria |
| Kaya 2021 | Ineligible comparison: one type of PFMT versus another type of PFMT |
| Kim 2009 | Ineligible comparator: PFMT versus ExMI |
| Liu 2008 | Ineligible comparison: ExMI versus PFMT |
| Marchiori 2010 | Ineligible comparison: one form of PFMT versus another form of PFMT |
| Mariotti 2009 | Ineligible comparator: PFMT plus electrical stimulation plus biofeedback versus PFMT alone |
| Mathewson-Chapman 1997 | Ineligible population: randomisation occurred before surgery |
| Meng 2012 | Ineligible comparison: PFMT plus biofeedback versus PFMT alone |
| Montazeri 2020 | Ineligible population: randomisation occurred before surgery |
| Moore 1999b | Ineligible study design: literature review |
| Nehra 2001 | Ineligible study design: cross-over RCT |
| Novick 2014 | Ineligible comparison: verbal and written instructions versus verbal and written instructions |
| Nowak 2007 | Ineligible comparison: electrical stimulation versus PFMT |
| Oh 2020 | Ineligble comparison: PFMT plus biofeedback versus PFMT alone |
| Oldham 2001 | Ineligible population: study in women |
| Opsomer 1994 | Ineligible comparator: PFMT plus electrical stimulation plus biofeedback versus PFMT alone |
| Overgård 2008 | Ineligible population: preoperative randomisation |
| Pané-Alemany 2021 | Ineligible comparison: one form of electrical stimulation versus another form of electrical stimulation |
| Park 2012 | Ineligible population: randomisation occurred before surgery |
| Parsons 2004 | Ineligible population: study in women |
| Perissinotto 2008 | Ineligible population: randomisation occurred before surgery |
| Radzimińska 2019 | Ineligible study design: cross-over RCT |
| Robinson 2008 | Ineligible population: preoperative randomisation |
| Sacco 2011 | Ineligible population: randomisation occurred before surgery |
| Salinas Casado 1996 | Ineligible study design: not an RCT |

| Study | Reason for exclusion |
|---|---|
| Santos 2017 | Ineligible comparison: PFMT + biofeedback versus PFMT alone |
| Seleme 2008 | Ineligible comparator: PFMT plus electrical stimulation plus biofeedback versus PFMT alone |
| Simeit 2010 | Ineligible study design: cross-over RCT (confirmed by translation of paper) |
| Soto González 2020 | Ineligible comparator: PFMT plus electrical stimulation plus biofeedback versus PFMT alone |
| Steenstrup 2017 | Ineligible comparison: one type of PFMT versus another type of PFMT |
| Tantawy 2019 | Ineligible intervention: whole body vibration is not an eligible intervention for the review |
| Wang 2018a | Ineligible comparison: electrical stimulation versus PFMT + biofeedback |
| Wille 2003 | Ineligible population: randomisation occurred before surgery |
| Yamanishi 1996 | Ineligible population: all adults, including both men and women |
| Yang 2022 | Ineligible intervention: Peplau nursing, which includes concepts from the Peplau interpersonal relationship theory and bladder function training. Control group received routine care and bladder function training. |
| Yokoyama 2004 | Ineligible comparison: electrical stimulation versus PFMT |
| Zachovajevienė 2019 | Ineligible comparison: one type of PFMT versus another type of PFMT |
| Zhang 2007 | Ineligible comparison: one form of biofeedback + PFMT versus another form of biofeedback + PFMT |
| Zhang 2015 | Ineligible outcome: the study contained participants who had undergone prostate surgery but also other forms of treatment. Correspondence with the study authors confirmed that data were not available for the surgical participants alone. The study was excluded because although this subset of the population was relevant, separate data not available and, even if available, that set of data would not be randomised. |

ExMI: extracorporeal magnetic innervation
PFMT: pelvic floor muscle training
RCT: randomised controlled trial

## Characteristics of studies awaiting classification *[ordered by study ID]*

### Gezginci 2020

| | |
|---|---|
| Methods | **Study design:** RCT<br>**Dates study conducted:** October 2019 to March 2020 |
| Participants | **Number of participants randomised:** actual enrolment 60<br>**Country:** Turkey<br>**Setting:** single centre ("in the clinic")<br>**Reason for undergoing prostate surgery:** localised prostate cancer<br>**Type of prostate surgery undertaken:** open RP<br>**Type of UI:** NR |

**Gezginci 2020** *(Continued)*

| | |
|---|---|
| | **Participants' age:** N/A (trial registration)<br><br>**Participants' BMI:** N/A (trial registration)<br><br>**Inclusion criteria:** over 40 years old; male; has localised prostate cancer; undergoing open RP; no preoperative UI; has a BMI of > 30 kg/m2; agrees to participate in research; literate<br><br>**Exclusion criteria:** has a congenital disorder of the urinary system; neurological disorders; history of TURP; communication or mental impairment; unable to perform pelvic floor muscle exercises |
| Interventions | **Group I: bladder training.** Participants instructed in lifestyle changes, such as nutrition, exercise and fluid management, as well as pelvic floor muscle exercises and bladder control techniques.<br><br>**Group II: no intervention.** Routine patient training delivered by a nurse working in the clinic. |
| Outcomes | **Primary outcomes**<br><br>• **Urinary incontinence-related quality of life:** assessed using the ICIQ-SF. The tool consists of 6 questions and scores range between 0-21, with higher scores indicating more impact on quality of life<br><br>**Secondary outcomes**<br><br>• **Lower urinary tract symptoms:** assessed using the International Consultation on Incontinence Questionnaire - Male Lower Urinary Tract Symptoms (ICIQ-MLUTS). The scale consists of 13 questions with a severity scale of 0-4 per question, as well as a 10-point VAS. Higher scores mean LUTS symptoms are more severe |
| Notes | **Conflicts of interest:** NR<br><br>**Study funding sources:** NR<br><br>**ITT analysis:** NR (trial registration)<br><br>**Follow-up time points:** 3 months<br><br>**Timing of randomisation:** unclear<br><br>**UI mentioned in inclusion criteria:** unclear - Quote "no preoperative urinary incontinence"<br><br>**Reason for Awaiting classification:** inclusion criteria reported in the trial registration does not clearly define when will be randomised to the study. We contacted the study authors for clarification on 25 May 2022. |

**Hoffmann 2005**

| | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: NR in English abstract |
| Participants | **Number of participants randomised**: 180<br><br>**Country**: Germany<br><br>**Setting**: NR in English abstract<br><br>**Reason for undergoing prostate surgery**: NR in English abstract<br><br>**Type of prostate surgery undertaken**: NR in English abstract<br><br>**Type of UI**: NR in English abstract |

**Hoffmann 2005** *(Continued)*

| | |
|---|---|
| | **Participants' age**: NR in English abstract<br><br>**Participants' BMI**: NR in English abstract<br><br>**Inclusion criteria**: "postoperative incontinence": no other details in English abstract<br><br>**Exclusion criteria**: NR in English abstract |
| Interventions | **Group I (n = 60):** PFMT + perianal electrical stimulation. No other details of intervention in English abstract. However: Quote: "The patients participated in a specific inpatient rehabilitation program".<br><br>**Group II (n = 60): PFMT + transanal electrical stimulation.** No other details of intervention in English abstract. However: "The patients participated in a specific inpatient rehabilitation program".<br><br>**Group III (n = 60): PFMT alone.** No other details of intervention in English abstract. However, quote: "The patients participated in a specific inpatient rehabilitation program". |
| Outcomes | • Self-assessment<br>• Objective characteristics of incontinence<br>• Quality of life according to QLQ-C 30<br>• Recorded data of the stimulation device |
| Notes | **Conflicts of interest**: NR in English abstract<br><br>**Study funding sources**: NR in English abstract<br><br>**ITT analysis**: NR in English abstract<br><br>**Follow-up time-points**: Quote: "upon admittance, upon discharge, and again after 3 months"<br><br>**Timing of randomisation**: NR in English abstract<br><br>**UI mentioned in inclusion criteria**: NR in English abstract<br><br>**Reason for Awaiting classification:** the paper is in German. A translation is needed to determine its eligibility for the review. |

**Lin 2011**

| | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: November 2007 to January 2010 |
| Participants | **Number of participants randomised**: 75 (NB: this is unclear in the study flow diagram)<br><br>**Country**: Taiwan<br><br>**Setting**: multicentre (Quote: "two hospitals in southern Taiwan")<br><br>**Reason for undergoing prostate surgery**: prostate cancer<br><br>**Type of prostate surgery undertaken**: RP<br><br>• Open RP: 50.74% (n = 34)<br>• Laparoscopic RP: 49.25% (n = 33)<br><br>**Type of UI**: NR<br><br>**Participants' age**: Total: 65.58 ± 6.7; range 47 to 79 years |

**Lin 2011** *(Continued)*

| | |
|---|---|
| | **Participants' BMI**: Total: 23.67 ± 2.71; range 18.16 to 28.90<br><br>**Inclusion criteria**: aged over 45, willing to participate in the research, had undergone RP<br><br>**Exclusion criteria**: history of pelvic floor surgery |
| Interventions | **Group I (n = 44): exercise group (PFMT).** All participants completed a 1-hour class about prostate anatomy, the RP procedure and the relationship between the surgery and UI. After catheter removal, the patients in the exercise group took part in PFMT as part of their regular activities (4 times a day, performing 20 pelvic floor muslce contractions and relaxations each time). These were taught by a research assistant. They also received a DVD and pamphlet as a reminder of how to do to the exercises.<br><br>**Group II (n = 31): non-exercise group (no intervention).** All participants completed a 1-hour class about prostate anatomy, the RP procedure and the relationship between the surgery and UI. After this, they were not taught any exercises and did not receive a DVDs or pamphlet. |
| Outcomes | • **Objective assessment of incontinence:** measured by 1-hour pad test<br>• **Personal features and disease-related variables:** age, marital status, education level, employment status and exercise habits, Gleason score, BMI, prostate-specific antigen value, operation type, nerve sparing procedures, weight of excised prostate, collated using a participant-reported questionnaire<br>• **Compliance:** measured in the exercise group by research assistants who called the participants on the phone (twice during the first month after RP and one per month thereafter), discussing with them the challenges faced when performing the exercises. The non-exercise group did not discuss compliance, but were still called, with conversation focusing on complications after surgery and life experience after RP |
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: Quote: "We would like to thank the National Science Council Grant of Taiwan for financial support (NSC 96-2314-B-214-007; NSC 97-2314-B-214-009-MY2)."<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 3 and 6 months<br><br>**Timing of randomisation**: unclear - inclusion criteria says that participants had to undergo RP to be eligible but also says, quote: "Patients who were scheduled to undergo RP for prostate cancer were referred by the head nurse of the urological ward and randomly assigned to the exercise group or to the non-exercise group before their first visit to the hospital".<br><br>**UI mentioned in inclusion criteria**: unclear - "one patient was excluded from the study because he experienced no UI". Suggests they had to have PPI but not explicitly stated.<br><br>**Reason for Awaiting classification:** it is not clear from the text whether the participants were randomised before or after surgery. The study authors were contacted for clarification on 6 December 2021 and again on 24 January 2022. |

**Mozafari 2021**

| | |
|---|---|
| Methods | **Study design:** RCT<br><br>**Dates study conducted:** first enrolment in 2021 |
| Participants | **Number of participants randomised:** target sample size 76<br><br>**Country:** Iran<br><br>**Setting:** NR |

**Mozafari 2021** *(Continued)*

| | |
|---|---|
| | **Reason for undergoing prostate surgery:** NR (though likely BPH due to undertaking TURP)<br><br>**Type of prostate surgery undertaken:** TURP<br><br>**Type of UI:** NR<br><br>**Participants' age:** N/A (trial registration)<br><br>**Participants' BMI:** N/A (trial registration)<br><br>**Inclusion criteria:** TURP at least 1 and maximum 3 days; aged 65 or older; lack of other pelvic surgery history; failure to diagnose prostate cancer after surgery, based on biopsy and pathology; willingness to participate in research and have informed consent; primary and higher literacy rate; achieving score of 24 or over on the MMSE to determine whether teachable and has no dementia; score 4 or higher on the Urinary Incontinence Diagnosis Questionnaire; score more than 5 on the Edmonton Frailty Scale<br><br>**Exclusion criteria:** UTI immediately after surgery; having a heart attack and stroke after entering intervention |
| Interventions | **Group I: Kegel exercises.** Participants will be taught the location of the pelvic floor muscles and then asked to contract the muscles for five seconds before relaxing again. Participants will perform 60 contractions each day, three times per day (20 in morning, 20 at noon, 20 at bedtime) for 12 weeks. Participants will also be given a pamphlet about the exercises as well as a checklist to count the Kegel exercises.<br><br>**Group II: not described.** |
| Outcomes | **Primary outcomes**<br><br>• **Urinary incontinence: assessed** using an abridged form of the ICIQ<br>• **Self-esteem:** assessed using the Rosenberg Self-Esteem Scale<br>• **Frailty Index:** assessed using the Edmonton Frailty Scale<br><br>**Secondary outcomes**<br><br>• None reported |
| Notes | **Conflicts of interest:** NR<br><br>**Study funding sources:** Quote:"No - possible costs are paid by the student himself."<br><br>**ITT analysis:** NR (trial registration)<br><br>**Follow-up time points:** 1 and 2 months<br><br>**Timing of randomisation:** unclear - quote: "at least one day and at most 3 days" after TURP<br><br>**UI mentioned in inclusion criteria:** yes<br><br>**Reason for Awaiting classification:** no details of the comparator are reported within the trial registration. We contacted the study authors on 26 May 2022 for clarification. The authors replied on 27 May 2022 indicating that they could provide more information once the study was published. |

**Ribeiro 2010**

| | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: July 2006 to September 2007 |
| Participants | **Number of participants randomised**: 73 |

**Ribeiro 2010** *(Continued)*

| | |
|---|---|
| | **Country**: Brazil<br><br>**Setting**: single centre ("at our institution")<br><br>**Reason for undergoing prostate surgery**: clinically localised prostate cancer<br><br>**Type of prostate surgery undertaken**: RRP<br><br>**Type of UI**: NR<br><br>**Participants' age**: Group I: 62.2 ± 6.3; Group II: 65.6 ± 8.0<br><br>**Participants' BMI**: Group I: 26.0 ± 3.4; Group II: 27.3 ± 4.0<br><br>**Inclusion criteria**: could regularly attend an ambulatory schedule<br><br>**Exclusion criteria**: prior urethral, bladder or prostate surgery, pelvic radiotherapy; neurological disease with a possible impact on continence; any medical condition that could limit participation in training program |
| Interventions | **Group I (n = 36): PFMT + biofeedback.** Each session lasted 30 minutes and was performed by the same physiotherapist. An electromyographic apparatus was used; a surface electrode was inserted into the anus and the reference electrode placed on the left lateral malleolus. In the right, lateral decubitus position, participants practiced 3 sets of 10 rapid contractions while viewing a computer monitor to help improve the phasic musculature component. They then practiced 3 sustained contractions of 5, 7 or 10 seconds, dependent on their ability to maintain the contraction. They were then placed in the supine position, hips flexed to approximately 60 degrees, to undertake 10 contractions during prolonged expiration while avoiding the Valsalva maneuver. Verbal and written instructions were used to undertake home exercises while lying down, sitting and standing.<br><br>**Group II (n = 37): usual care.** The participants were not given formal education about PFME but did receive brief, verbal instructions from the urologist to contract the pelvic floor muscle. However, they were not given a specific exercise schedule. |
| Outcomes | **Primary outcomes**<br><br>• **Objective continence:** assessed using number of pads used; using 1 pad or less daily was defined as continence<br>• **Severity of incontinence:** assessed using the 24-hour pad test and defined as mild (< 20 gm), moderate (between 21 to 74 gm) or severe (> 75 gm)<br><br>**Secondary outcomes**<br><br>• **Incontinence symptoms:** assessed using ICSI<br>• **Lower urinary tract symptoms:** assessed by ICST<br>• **Impact of incontinence on quality of life:** assessed using IIQ-7<br>• **Pelvic floor muscle strength:** assessed by a digital test graduated according to the Oxford scale |
| Notes | **Conflicts of interest**: NR<br><br>**Study funding sources**: "Supported by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), 2003/07656-7."<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 1, 3, 6 and 12 months<br><br>**Timing of randomisation**: unclear - paper sometimes suggestive of preoperative randomisation and other times suggests postoperative randomisation<br><br>**UI mentioned in inclusion criteria**: no |

**Ribeiro 2010** *(Continued)*

| | |
|---|---|
| | **Reason for Awaiting Classification:** it is unclear when the participants were randomised (pre- or post-surgery). We contacted the study authors on 28 October 2021 and again on 15 November 2021 for clarification. |

**Wang 2018b**

| | |
|---|---|
| Methods | **Study design**: RCT<br><br>**Dates study conducted**: October 2014 to April 2016 |
| Participants | **Number of participants randomised**: 74 (NB: as per the study flow diagram, 70 were randomised but methods section states 37 people per group were randomised)<br><br>**Country**: China<br><br>**Setting**: single centre (First Affiliated Hospital of Anhui Medical University)<br><br>**Reason for undergoing prostate surgery**: prostate cancer<br><br>**Type of prostate surgery undertaken**: Robot Assisted Radical Prostatectomy (RARP)<br><br>**Type of UI**: NR<br><br>**Participants' age**: Group I: 69.2 ± 6.7; Group II: 70.1 ± 5.0<br><br>**Participants' BMI**: NR<br><br>**Inclusion criteria**: diagnosis with Pca; treatment at the Department of Urology at the study hospital; reading and writing ability; ability to complete questionnaires and receive follow-up<br><br>**Exclusion criteria**: history of UI; any serious physical illnesses (e.g. heart failure, stroke); any malignant tumour metastasis; refusal to participate or submit to the study procedures and schedule; UI caused by other reasons after discharge (e.g. by trauma) |
| Interventions | **Group I (n = 37): Continuous nursing care (written and verbal instruction on PFMT + telephone or face to face PFMT instruction).** Consisted of seven team members (a co-chief superintendent nurse responsible for overall control, organising and managing the nursing plans; a senior paramedic from the Department of Urology responsible for discharged patients' health education and information; an interventional colostomy expert responsible for guidance on relevant professional knowledge for patients with UI; and four primary nurses). They all received relevant continuing nursing care training courses and passed theoretical and practical exams.<br><br>Continuous nursing care was divided into two stages. Stage 1 began 3 days before discharge and was implemented by the health education nurses and primary nurses. They clarified the needs of patients and gave targeted health education and guidance. The nursing prescription was given on the day of discharge and included timing and frequency of PFMT.<br><br>Stage 2 occurred after patient discharge and included telephone calls, group teaching, home visits, Quote: "etc." Problems reported by patients were recorded and guidance was given (which could include guidance on diet, preventing complications, recommendations for daily activities, and PFMT methods). Frequency of calls was increased to once a week for those with UI until the problem was reduced and solved. Psychological nursing was provided, and PFMT exercises were supervised over the telephone. For those whose issues could not be solved over the phone, home visits were carried out at their convenience. These visits included noting the occurrence of complications, reviewing the performance of the functional exercise, teaching methods for PFMT, and assessing patients' psychological conditions. Personnel taught and corrected patients' performance of PFMT and bladder function exercises using guidance and written instruction. The Department of Urology offered group teaching once a month, which included guidance for preventing complications; guidance for functional exercise of PFMs, emphasis on the importance of functional exercise, information about the correct treatment for different complications, onsite psychological nursing |

**Wang 2018b** *(Continued)*

| | |
|---|---|
| | for patients with UI, information on the transiency of UI. For participants with less understanding and insufficient implementation capacity, this was carried out as a one to one intervention.<br><br>**Group II (n = 37): routine discharge education (no treatment).** The discharge notice, time for outpatient follow-up and the department's follow-up telephone number were indicated on the discharge summary sheet. The participants could visit the outpatient department when necessary. |
| Outcomes | **Primary outcomes**<br><br>• **Frequency, amount and effects of urine leakage:** assessed by the Chinese version of the ICI-Q-SF. Scoring between 0-21. Urine leakage frequency scored as 0 for "never" up to 5 for "all the time". Urine leakage amount scored as 0 for "none" up to 6 for "a large amount". The impact of urine leakage on daily lives classified from 0 ("no effect") to 10 ("great influence"). The three scores were summed to obtain the global ICI-Q-SF score<br>• **Urinary incontinence:** 1-h pad test. Presence of UI was determined as more than 1 g of weight difference in the pad at 1 hour.<br><br>**Secondary outcomes**<br><br>• **Quality of life:** measured using the Chinese version of SF-36 |
| Notes | **Conflicts of interest**: Quote "The authors declare that there is no conflict of interest"<br><br>**Study funding sources**: NR<br><br>**ITT analysis**: NR<br><br>**Follow-up time points**: 1, 3 and 6 months after discharge<br><br>**Timing of randomisation**: unclear<br><br>**UI mentioned in inclusion criteria**: no<br><br>**Reason for Awaiting classification:** it is unclear whether the participants in the study needed to be incontinence post-prostatectomy. We contacted the study authors on 10 February 2022 and on 24 Februrary 2022 for clarification. |

BPH: benign prostatic hyperplasia
BMI: body mass index
ExMI: Extracorporeal Magnetic Innervation
ICIQ-MLUTS: International Consultation on Incontinence Questionnaire - Male Lower Urinary Tract Symptoms
ICI-Q-SF: International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form
ICSI: Interstitial Cystitis Symptom Index
ICST: total score of the International Continence Society male Short Form questionnaire
IIQ-7: Incontinence Impact Questionnaire, Short Form
I-QOL: Incontinence Quality of Life Questionnaire
ITT: intention-to-treat
MMSE: Mini Mental State Examination
NR: not reported
PFMT: pelvic floor muscle training
PCa: prostate cancer
PPI: post-prostatectomy incontinence
QLQ-C 30: EORTC Core Quality of Life questionnaire
RCT: randomised controlled trial
RP: radical prostatectomy
RRP: radical retropubic prostatectomy
SF-36: Short Form 36
TURP: transurethral resection of the prostate
UI: urinary incontinence
UTI: urinary tract infection

## Characteristics of ongoing studies *[ordered by study ID]*

### Celenay 2021

| | |
|---|---|
| Study name | Effects of external electric stimulating in individuals with urinary incontinence after prostatectomy |
| Methods | **Design:** RCT |
| Participants | **Estimated enrolment:** 40<br><br>**Country:** Turkey<br><br>**Inclusion criteria:** male with stress or stress-predominant MUI symptoms after undergoing prostatectomy surgery in the urology clinic; over 40 years old; having a score of 24 or more on the Mini Mental Test for individuals over 65 years old; no residual cancerous tissue; volunteers to participate in the study<br><br>**Exclusion criteria:** serious cardiovascular disease (e.g. unstable angina and arrhythmia, heart failure); sensory loss; ongoing urinary infection; UUI only; pacemaker; receiving active cancer treatment (radiotherapy, chemotherapy); lack of evaluation parameters; not continuing the treatment regularly |
| Interventions | **Group I: electrostimulation:.** participants receive external neuromuscular electrical stimulation in the supine position for 30 minutes 3 days per week for 8 weeks. The stimulation consisted of eight external electrodes, including two sheaths around the thigh and 4 electrodes on each leg. Electrodes were placed on the anterior and posterior proximal tights, buttocks and outside of the hips. A symmetrical biphasic current at a frequency of 50 Hz with work-rest cycles of 5 seconds each applied.<br><br>**Group II: sham stimulation:** for 45 minutes twice a week, a vacuum electrode was connected from a combined vacuum electrotherapy device over the pelvis and this. Only the vacuum was applied while the participant was in the supine position and no current was applied. |
| Outcomes | **Primary outcomes**<br><br>• **1-hour pad test:** participants will be asked to drink 500 mL of water in 15 minutes then remain active for 30 minutes to provoke involuntary urine leakage with a full bladder. The pad weight will be measured<br>• **UI symptoms:** assessed using the ICIQ-SF<br><br>**Secondary outcomes**<br><br>• **Quality of life:** assessed using the KHQ, with scores ranging from 0 (best health) to 100 (worst health)<br>• **Sexual function:** assessed using the IIEF-5, which contains 5 main topics. Each question is scored from 0-5. A score of 5-7 is severe, 8-11 is moderate, 12-16 is mild-moderate, 17-21 is mild and 22-25 is no erectile dysfunction<br>• **Perception of subjective improvement:** assessed using a 4-point Likert scale<br>• **Treatment satisfaction:** assessed using a 5-point Likert scale |
| Starting date | December 2021 |
| Contact information | Seyda Toprak Celenay<br>+90312 906 1000<br>sydtoprak@hotmail.com |
| Notes | **Follow-up time points:** 8 weeks |

### Celenay 2022

| | |
|---|---|
| Study name | The effects of neuromuscular electrical stimulation in individuals with urinary incontinence after prostatectomy |
| Methods | **Design:** RCT |
| Participants | **Estimated enrolment:** 50<br><br>**Country:** Turkey<br><br>**Inclusion criteria:** male with stress or stress-predominant MUI symptoms after undergoing prostatectomy surgery in the urology clinic; over 40 years old; volunteers to participate in the study<br><br>**Exclusion criteria:** severe cardiovascular disease (unstable angina and arrhythmia, heart failure etc.); sensory loss; presence of ongoing urinary infection; UUI only; pacemaker; active cancer treatment (radiotherapy, chemotherapy); those who have undergone TURP; those with a problem that interferes with co-operation and understanding |
| Interventions | **Group I: neuromuscular electrical stimulation.** Applied with the INNOVO brand device for 30 minutes per day, 3 times a week for 4 weeks.<br><br>**Group II: sham electrostimulation**. Applied from the same INNOVO brand device as Group I, with the same regimen, but with no current delivered |
| Outcomes | **Primary outcome**<br><br>• **Urinary incontinence severity:** assessed with the 1 hour pad test, whereby 2 g is considered normal, 2-10 g is mild, 10-50 g is moderate and 50 g is severe SUI<br><br>**Seconary outcomes**<br><br>• **Presence of UI symptoms:** assessed with the ICIQ-SF, consisting of 6 questions where a lower score means less impact of the urinary symptoms<br>• **Quality of life:** assessed with the KHQ. Score ranges from 0-100, where 100 is the worst score with greatest impact on quality of life<br>• **Sexual function:** assessed with the IIEF-5. Includes 5 different topics each scored from 1-5. Total score of 5-7 is severe, 8-11 is moderate, 12-16 is mild-moderate, 17-21 is mild and 22-25 is no erectile dysfunction<br>• **Patients' subjective perception of improvement:** assessed using a 4-point Likert scale where 4 is completely cured and 1 is worse<br>• **Patient satisfaction:** assessed with a 5-point Likert scale where 5 is very satisfied and 1 is not at all satisfied |
| Starting date | March 2022 |
| Contact information | Seyda Toprak Celenay<br>+90312 906 1000<br>sydtoprak@hotmail.com |
| Notes | **Follow-up time points:** 4 weeks |

### Lordelo 2017

| | |
|---|---|
| Study name | Radiofrequency in the treatment of urinary incontinence after radical prostatectomy: randomised clinical trial |
| Methods | **Design**: RCT |

**Lordelo 2017** *(Continued)*

| | |
|---|---|
| Participants | **Estimated enrolment**: 62<br><br>**Country**: Brazil<br><br>**Inclusion criteria**: 18 to 65 years old; clinical complaints of UI after prostatectomy; agree to voluntarily participate in research<br><br>**Exclusion criteria**: less than 45 days postoperative; difficulty understanding the proposed instruments; neurological degenerative chronic diseases; implantable cardioverter defibrillators; carriers of iatrogenic metals in the pelvic region |
| Interventions | **Group I: radiofrequency on and kinesiotherapy.** Radiofrequency with CAPENERGY device (has two electrodes including an active electrode, which will be introduced to the anal region using a condom and gel. The other electrode will be coupled to the patient's hip, functioning as earth. Temperature will be 41 degrees Celsius and will be maintained for 2 minutes. Participants will be placed in the decubitus position for the treatment. Five of the radiofrequency sessions will be performed, with a 7-day interval between them, and will last approximately 20 minutes. Kinesiotherapy will be performed once a week, for a total of 5 sessions. Verbal information about location, function and the correct way to contract the pelvic floor will initially be given.<br><br>**Group II: radiofrequency off (sham) and kinesiotherapy.** In the lateral decubitus position, the RF anal probe will be inserted with the gel previously heated; the RF will be turned off. Kinesiotherapy will be performed once a week, for a total of 5 sessions. Verbal information about location, function and the correct way to contract the pelvic floor will initially be given. The participants will be advised on the "Knack" |
| Outcomes | **Primary outcome**<br><br>• **Quantification of urinary loss in grams:** measured with 1-hour pad test<br><br>**Secondary outcomes**<br><br>• **Quantification of urinary loss after different physical activities:** measured by 1-hour pad test<br>• **Quality of life:** measured by "scale questionnaire"<br>• **Erectile dysfunction:** assessed by IIEF-5<br>• **UI-related quality of life:** assessed using the ICIQ-SF (range 0-21, with higher scores meaning a greater impact on quality of life) |
| Starting date | 5 December 2016 |
| Contact information | Patricia Lordelo<br>Email: pvslordelo@hotmail.com |
| Notes | **Follow-up time points:** 1 month, 6 months, 1 year |

**Okhovatian 2021**

| | |
|---|---|
| Study name | The evaluation of an integrated physical therapy protocol on male stress urinary incontinence after radical prostatectomy |
| Methods | **Design:** RCT |
| Participants | **Estimated enrolment:** 60<br><br>**Country:** Iran<br><br>**Inclusion criteria:** SUI secondary to RP diagnosed by a urologist; aged between 50 to 80 |

**Okhovatian 2021** *(Continued)*

| | |
|---|---|
| | **Exclusion criteria:** major neurological problems (e.g. Parkinson's, MS, central nervous system abnormalities); major orthopaedic problems in spine and pelvis; using duloxetine or similar drugs that have a similar effect on incontinence; uncontrolled diabetes or other peripheral nerve system diseases that cause sensation problems; any previous rehabilitation treatment for incontinence after previous surgery; skin inflammation, thrombosis or pacemaker |
| Interventions | **Group I: Integrated therapy (electrostimulation plus PFMT).** Electrotherapy will be applied with an inferential current, with electrodes placed at the lower abdominal (above the inguinal ligament) and higher one third of the thigh; a 0-100 Hz frequency will be applied for 15 minutes. The manual therapy (neuromuscular therapy technique) will be performed for iliopsoas and the diaphragm muscles. Exercise therapy for diaphragmatic breathing exercise, Knack exercises, Kegel exercises and pelvic floor muscle exercises (of gluteus maximus and medius, multifidus and abdominal muscles) will be performed. The exercises will be taught in the first session and then monitored by the therapist. Sets, number and intensity of the exercises will be based on patient status as assessed by the therapist. An instruction manual will also be provided to assist in performing the exercises correctly.<br><br>**Group II: PFME.** 12 sessions of exercise therapy consisting of the Knack exercise, Kegel exercises and PFMEs<br><br>**Group III: sham electrotherapy.** Performed for 12 sessions across 4 weeks. Electrodes are placed at the lower abdominal (above the inguinal ligament) and higher one third of thigh in the medial side, but with no current applied. |
| Outcomes | **Primary outcomes**<br><br>• **Quality of life:** assessed using the SF-12<br>• **Urination amount:** assessed with a calibrated container<br>• **Fluid intake:** assessed with a calibrated container<br>• **Incontinence episodes:** assessed using a bladder diary<br>• **Urinary frequency:** assessed using a bladder diary<br><br>**Secondary outcomes**<br><br>• None reported |
| Starting date | **Date of first enrolment:** 7 October 2021 |
| Contact information | Farshad Okhovatian<br>+98 21 7754 2057<br>okhovatianf@sbmu.ac.ir |
| Notes | **Follow-up time points:** daily or monthly dependent on outcome; exact time points for outcome measurement not specified |

**Peters 2019**

| | |
|---|---|
| Study name | A Single-blind, randomized study of the BTL Emsella$^{TM}$ Chair versus sham for the treatment of stress urinary incontinence |
| Methods | **Design**: RCT |
| Participants | **Estimated enrolment**: 110<br><br>**Country**: USA<br><br>**Inclusion criteria** |

**Peters 2019** *(Continued)*

- **For all participants:** able to read, understand and provide written, dated informed consent prior to screening; likely to comply with study protocol (including completing study questionnaires and communicating with study personnel about adverse events and other clinically-important information); 18 to 80 years old at screening; positive cough or bladder stress test at screening; agrees not to start any new treatment (medication or otherwise) during treatment and follow-up; agrees to maintain a stable dose of any medication known to affect lower urinary tract function (including, but not limited to: anticholinergics, tricyclic antidepressants, beta-3 adrenergic agonists, a-adrenergic blockers) throughout treatment and follow-up
- **For female participants:** agrees to discontinue bladder support devices (including, but not limited to, vaginal pessaries) during the screening, treatment and follow-up; if of child-bearing age, agree to practice approved birth-control methods (oral contraceptives, condom barrier, injection, diaphragm or cervical cap, vaginal contraceptive ring, IUD, implantable contraceptive, surgical sterilisation (bilateral tubal ligation), vasectomised partner(s))
- **For male participants:** 4 months or more post-prostatectomy

**Exclusion criteria**

- **For all participants:** pelvic floor physical therapy (including muscle training and/or electrical stimulation) in a clinical setting within 30 days prior to screening; morbidly obese (defined as BMI of 40 or greater); pulmonary insufficiency (defined as difficulty breathing and fatigue, especially during exercise, chest pain such as squeezing, pressure or tightness, sensation of rapid or irregular heartbeat (palpitations), swelling of the legs or feet, dizziness or fainting, and/or bluish discolouration of the nails and/or lips (cyanosis)); any condition causing a lack of normal skin sensation to the pelvic, buttocks. and lower extremities; implanted cardiac pacemaker or metal in the body (including, but not limited to, drug pumps, neurostimulators, electronic implants, copper IUDs and/or defibrillators); piercing between the waist and knees and not willing to remove it before each treatment; active urethral diverticula; known vesicoureteral reflux; currently healing from surgical procedures where muscle contraction may disrupt healing process; treatment with urethral bulking agents within 6 months prior to screening visit; has malignant tumour in any location in the body; previously used the BTL Emsella device; UI of neurogenic etiology (e.g. MS, spina bifida, Parkinson's, spinal cord injury, diabetic neuropathy); UTI requiring treatment as determined by the investigator at the screening visit; participating in an investigational study that may impact study results or previously received investigational drug or treatment within 30 days of screening visit; current or history of any physical condition that, in the opinion of the investigator, may put the participant at risk or interfere with the study results
- **For female participants only:** pregnant or planning to become pregnant at screening or any time during study period; history of surgery with insertion of vaginal mesh for SUI; vaginal prolapse beyond the introitus; vaginal rejuvenation treatment (including laser and radiofrequency therapies) within 6 months prior to screening visit.

**Note from trial registration:** quote: "for the sake of preserving scientific integrity, one or more of the eligibility criteria have been left off the list posted while the trial is ongoing. A full list of eligibility criteria will be posted upon completion of the trial."

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| Interventions | **Group I: BTL Emsella chair (electrical stimulation).** Quote: "The Emsella Chair is a novel high-intensity focused electromagnetic (HIFEM) technology for the treatment of SUI, in addition to other pelvic floor related disorders. HIFEM technology induces deep pelvic floor muscle contractions designed to deliver the equivalent of 11,200 Kegel exercises over 28 minutes. The treatment paradigm consists of 3 different phases. The phases consist of an intense stimulation of the pelvic floor muscles (PFM), which consists of stimulation and relaxation. The repetition of the phases and focused electromagnetic energy delivery leads to pelvic floor stimulation, adaptation, and remodelation." Participants to be asked to sit on the centre of the chair and the height of the chair will be adjusted so that their feet are on the floor. The settings of the chair will be gradually increased to the participant's sensory threshold (i.e. maximum tolerable). It will then be decreased slightly and stay unchanged for remainder of treatment time. Treatment threshold should be increased at each treatment until the participant reaches 100%.<br><br>**Group II: Sham BTL Emsella chair (electrical stimulation).** The participants in the sham group will be positioned on the chair in the same manner as the intervention group and will be given the |

**Peters 2019** *(Continued)*

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| | same sensations without the active HIFEM technology. The program will have a limitation on amplitude, set below therapeutic level (< 10% power). |
| Outcomes | **Primary outcome**<br>• **Responder rate:** assessed by marking the participants as a "responder" (50% or more reduction from baseline in the number of stress incontinence events)<br>**Secondary outcomes**<br>• **Change in total number of subject-reported SUI episodes over 3 days:** assessed by using 3-day voiding diaries<br>• **Change in subject-reported impression of SUI severity:** measured by Patient Global Impression of Severity scale (PGI-S). "The subject will check the box that describes how their condition is now. The available options are normal, mild, moderate, or severe."<br>• **Change in subject-reported impression of SUI improvement:** measured by Patient Global Impression of Improvement scale (PGI-I). Quote: "The subject will select one of the following options, (very much better, much better, a little better, no change, a little worse, much worse, very much worse) to describe their urinary tract symptoms now versus prior to study treatment."<br>• **Change in subject-reported urogenital distress:** measured by Urinary Distress Inventory questionnaire (UDI-6). 6-point questionnaire scored as follows: 0 = no, 1 = not at all, 2 = somewhat, 3 = moderately, 4 = quite a bit (all divided by 6 and multiplied by 25 to calculate raw score).<br>• **Change in subject-reported impact of UI on daily life:** as measured by Incontinence Quality of Life questionnaire (I-QOL). Has 22 incontinence-specific items, on a five-point ordinal response scale (1 = extremely, 5 = not at all). Summed score is transformed into 0-100, with 0 being poor QoL and 100 being maximum QoL<br>• **Change in subject-reported FI:** assessed by Cleveland clinic incontinence score (Wexner). Type of FI reported by subject. Question measured from 0 (never) to 5 (always).<br>• **Change in subject-reported sexual function:** assessed with Brief Sexual Function Inventory questionnaire (BSFI) for male subjects (female subjects assessed with the Female Sexual Function Index questionnaire (FSFI)). Scores on BSFI range from 0 to 44, with lower scores indicating greater dysfunctionChange in subject-reported pain: measured on a VAS from 0 (no pain) to 10 (worst possible pain)<br>• **Safety and tolerability:** assessed in relation to adverse events<br>• "The secondary object for durability for this study are to determine whether subjects in the Emsella Chair group continue to have a higher responder rate than the Sham group" |
| Starting date | 18 December 2019 |
| Contact information | Erica Zagaja, RN<br>Email: Erica.Zagaja@beaumont.org<br><br>Jennifer Giordano, RN<br>Email: Jennifer.Giordano@beaumont.org |
| Notes | **Follow-up time points:** 4 and 8 weeks<br><br>**Note:** This study contains both men and women but the inclusion criteria are reported separately for both. |

**Unal 2020**

| | |
|---|---|
| Study name | Effectiveness of magnetic stimulation in patients with urinary incontinence after radical prostatectomy: a prospective randomized sham controlled clinical study |
| Methods | **Design**: RCT |

**Unal 2020** *(Continued)*

| | |
|---|---|
| Participants | **Estimated enrolment**: 40<br><br>**Country**: Turkey<br><br>**Inclusion criteria**: men 18-80 years old; RP with incontinence equal to or over 50 g per 24 hours; within 1 month to 1 year after catheter removal; willing to complete and do the quality of life scale; understand procedures, benefits and possible side-effects; able to give written, informed consent<br><br>**Exclusion criteria**: history of conservative treatment after RP (including magnetic stimulation); previous urological surgery history; UI history before RP; transurethral resection of the prostate due to BPH; receiving radiotherapy; presence of UTI; heart failure, presence of pacemaker, implanted defibrillator; continuing treatment for arrhythmias; undiagnosed lower abdominal pain; electronic device or metallic implant applies to areas between the lumbar region and lower extremities; use of drugs that may affect bladder function (e.g. antimuscarinic, duloxetine, tricyclic antidepressant); history of neurogenic bladder, peripheral or central neurological pathology |
| Interventions | **Group I: magnetic stimulation.** Particpants will sit in a magnetic coil chair, in which magnetic flux is generated; the current stimulates the nerves or muscles of the pelvic floor. To administer the magnetic stimulation, a simulation amplitude of 200 us and repetition of 10 Hz for 10 minutes with 2 minutes of rest in-between, followed by 50 Hz for 10 minutes (5 seconds on, 5 seconds off) for 20 minutes total. During the session, the participants will receive gradually increasing intensity before reaching the maximum. The participants will receive the magnetic stimulation twice a week for 8 weeks (16 sessions total).<br><br>**Group II: sham magnetic stimulation.** The sham stimulation will be given at the same duration, frequency, current and intensity as Group I, with the same general experience (they will hear the same sounds, lighting and sensation of vibration). The same chair will be used as in Group I. The sham therapy will be given by the study co-ordintor placing a thin deflector lead/ aluminium coated plate on the magnetic coil of the chair so that it prevents a magnetic flux from penetrating into the patient. The participants will receive the sham magnetic stimulation twice a week for 8 weeks (16 sessions total). |
| Outcomes | **Primary outcome**<br><br>• **Improvement in incontinence:** participants will be considered improved if they have a 50% or greater reduction in incontinence episodes<br><br>**Secondary outcomes**<br><br>• **Severity of incontinence:** assessed using 24-hour pad testFrequency of voiding, incontinence episodes, nocturia, number of pad used: all assessed using a 3-day bladder diary<br>• **Quality of life:** assessed using IIQ-7 scale<br>• **Sexual function:** assessed with International Index of Erectile Function (IIEF)<br>• **Anxiety and depression:** measured with Hospital Anxiety and Depression Scale (HADS)<br>• **Treatment satisfaction:** evaluated by the participants, asked to measure the change of their urinary incontinence on a 5-point Likert scale ( from 5 being to 1 being ery unsatisfied)<br>• **Continence rate (treatment success):** continence measured as participants with 8 g or less on the 24-hour pad test<br>• **Cure (dry) and improvement rate:** quote: "the absence of will be evaluated as "dryness"." |
| Starting date | January 2021 |
| Contact information | Necmettin Yildiz<br>Email: necmi74tr@hotmail.com |
| Notes | **Follow-up time points:** 6 weeks |

**Yıldız 2022**

| | |
|---|---|
| Study name | Efficacy of Perineal Electrical Stimulation in Men With Urinary Incontinence After Radical Prostatectomy. A Prospective Randomized Controlled Trial |
| Methods | **Design:** RCT |
| Participants | **Estimated enrolment:** 60<br><br>**Country:** Turkey<br><br>**Inclusion criteria:** aged 18 to 80 years; men with RP with incontinence > 8 g per 24 hours and no residual cancer after RP on pathological examination; within 2 weeks to 1 year after catheter removal; willingness to complete and do the quality of life scale; understand procedures, benefits and possible side-effects; able to give written, informed consent<br><br>**Exclusion criteria:** history of UI before RP; history of conservative treatment after RP, including electrical stimulation; prolonged indwelling catheterisation (of more than 15 days); previous history of urological surgery; TURP due to BPH; receiving radiotherapy; presence of urethral stricture and UTI; heart failure, presence of a pacemaker, implanted defibrillator; use of drugs that may affect bladder function (e.g. antimuscarinic, duloxetine, tricyclic antidepressants); history of neurogenic bladder, peripheral or central neurological pathology; inability to attend treatment sessions due to distance or physical limitations |
| Interventions | **Group I: perineal electrical stimulation.** Performed in the lithotomy position via a stimulation device (Enraf Nonius Myomed 632) with perineal surface electrodes. Will be performed three days a week for 20 minutes a day; there will be a total of 24 sessions across 8 weeks. Stimulation parameters will be set at 50 Hz, a 5-10 s work-rest cycle and 300 ms pulse width. Symmetric biphasic pulse wave could be delivered at a range of 1-100 mA according to the patient's level of discomfort. Three surface electrodes of 2 cm diameter are used; two symmetrically at the perianal region (medial to ischial tuberosity) and one at the leg (ground-neutral). Surface electrodes will be used individually for every participant and sessions performed by an experienced urogynaecology rehabilitation nurse<br><br>**Group II: no intervention.** Participants will attend baseline assessment and not receive any instructions on how to perform PFMEs at home. After the final assessment, they will be invited to start treatment at the urogynaecological rehabilitation unit |
| Outcomes | **Primary outcome**<br><br>• **Continence rate:** defined as 8 g or less of urine on the 24-hour pad test<br><br>**Secondary outcomes**<br><br>• **Severity of incontinence:** assessed with the 24-hour pad test<br>• **Condition-specific quality of life:** assessed with the Quality of Life-Incontinence Impact Questionnaire. The questionnaire ranges from 0-21, with higher scores indicating a worse outcome<br>• **Participation in social activities:** assessed using the Social Activity Index, a 10 cm VAS scale where 0 is impossible to participate and 10 indicating no problems with participation<br>• **Anxiety and depression:** assessed with HADS, consisting of 14 items and 2 subscales. Higher scores indicate higher anxiety and depression levels on each subscale<br>• **Treatment satisfaction:** assessed using a 5-point Likert scale where higher scores indicate greater satisfaction |
| Starting date | January 2022 |
| Contact information | Hakan Alkan<br>alkangsc@yahoo.com |
| Notes | **Follow-up time points:** 8 weeks |

### Zaidan 2019

| | |
|---|---|
| Study name | The effect of electrostimulation on urinary Incontinence, pelvic floor muscle strength and impact on daily life of patients after radical prostatectomy: controlled experiment blind double randomised |
| Methods | **Design**: RCT |
| Participants | **Estimated enrolment**: 65<br><br>**Country**: Brazil<br><br>**Inclusion criteria**: patients with UI after retropubic radical prostatectomy; minimum time of one month and a maximum of six months after surgery; cancer staging at low and intermediate risks<br><br>**Exclusion criteria**: symptoms of UTI; symptoms of lower urinary tract obstruction; anal fistula; metal implant in the body; TURP; previous radiotherapy; neurological diseases; non-execution of the proposed treatment |
| Interventions | **Group I (n = 19): EE50 and EMAP (electrical stimulation and exercise).** Electrostimulation with an end-to-end electrode in the lateral decubitus position with knees and flexed hips. Parameters we a frequency of 50 Hz, pulse width of 500 us, biphasic current, intensity defined by the level of tolerance of the participant and perineal contraction time of 4 seconds before resting for 8 seconds for a period of 20 minutes. The physiotherapist verbally commanded the participants to contract the quote: "MAPS" during the electrical stimulation and relax at the time of electrical rest until the end of the session. Two minutes after the electrical stimulation, the same exercises as performed by the EMAP group (Group III) were performed. Sessions were delivered twice a week.<br><br>**Group II (n = 23): EE65 and EMAP (electrical stimulation and exercise).** Identical to Group I, except the frequency of the electrical stimulation was 65 Hz and the pulse width was 500 us.<br><br>**Group II (n = 23): EMAP.** The MAP exercises consisted of performing diaphragmatic inspiration along with relation of the MAPs and, upon slow expiration, contraction the MAPs as if to retain urine. In lateral decibitus position, knees and hips flexed, the physiotherapist requested the maximum contraction of the MAP with intervals of 6 seconds in-between (totaling 2 sets of 5 repetitions). They then requested contractions sustained for 4 seconds and intervals of 4 seconds (totaling 3 sets of 8 repetitions). The exercises were repeated a chair in a sitting position with feet on the floor, and leaning against the wall with the feet and knees "semifletidos". Performed twice a week. |
| Outcomes | **Primary outcome**<br><br>• **Urinary incontinence:** assessed using patient recollection of urinary symptoms, quantities of disposable protectors used per day, urine losses due to efforts, associated pathologies. Success defined as achieving urinary incontinence on a 1-hour pad test of < "1 g15" in addition to the use of no daily disposable protectors. Urine loss will be classified as insignificant (up to 1 g), light (1.1 to 9.9 g), moderate (10 to 49.9 g), severe losses (50 g and over) on post-pad protector test<br><br>**Secondary outcomes**<br><br>• **Strength of pelvic floor muscles:** assessed using a peritron perineometer; maximum values of three contractions will be recorded<br>• **Impact of incontinence on daily life (quality of life):** evaluated using the ICIQ-SF (assessing four questions of frequency, severity, amount of urine lost and impact of UI on daily life as well as a set of eight self-diagnosis items related to the causes or situations of UI experienced by patients, with only the first three being scored). Total score ranges from 0 to 21, with higher scores indicating a greater impact on QoL |
| Starting date | 25 February 2016 |
| Contact information | Patrícia Zaidan |

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| **Zaidan 2019** *(Continued)* | Email: patriciazaidan@gmail.com |
| Notes | **Follow-up time points:** quote: "after 20 treatment sessions or immediately after discharge from the patient" |

BPH: benign prostatic hyperplasia
BSFI: Brief Sexual Function Inventory
BMI: body mass index
FSFI: Female Sexual Function Index
HADS: Hospital Anxiety and Depression Scale
HIFEM: high-intensity focused electromagnetic
ICIQ-SF: International Consultation on Incontinence Questionnaire Short Form
IIEF-5: International Index of Erectile Function
IIQ-7: Incontinence Impact Questionnaire, Short Form
I-QOL: Incontinence Quality of Life questionnaire
IUD: intrauterine device
KHQ: King's Health Questionnaire
MS: multiple sclerosis
MUI: mixed urinary incontinence
PFM: pelvic floor muscle
PFME: pelvic floor muscle exercise
PFMT: pelvic floor muscle training
PGI-I: Patient Global Impression of Improvement
PGI-S: Patient Global Impression of Severity scale
QoL: quality of life
RCT: randomised controlled trial
RF: radiofrequency
RP: radical prostatectomy
SF-12: Short-Form 12
SUI: stress urinary incontinence
TURP: transurethral resection of the prostate
UDI-6: Urinary Distress Inventory questionnaire
UI: urinary incontinence
UTI: urinary tract infection
UUI: urgency urinary incontinence
VAS: visual analogue scale

## DATA AND ANALYSES

### Comparison 1. PFMT versus no treatment, sham treatment or verbal/ written instructions

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 1.1 Subjective cure or improvement in UI: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 1.2 Subjective cure or improvement in UI: > 6 to 12 months (other data) | 0 | | Other data | No numeric data |
| 1.3 Condition-specific quality of life: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 1.4 Objective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis) | 2 | 394 | Risk Ratio (M-H, Random, 95% CI) | 1.50 [1.33, 1.69] |

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 1.5 Objective cure or improvement in UI: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 1.6 Objective cure or improvement in UI: > 6 to 12 months (dichotmous meta-analysis) | 2 | 394 | Risk Ratio (M-H, Random, 95% CI) | 1.40 [0.80, 2.44] |
| 1.7 Adverse events relating to the viscera or anorectum (other data) | 0 | | Other data | No numeric data |

### Analysis 1.1. Comparison 1: PFMT versus no treatment, sham treatment or verbal/ written instructions, Outcome 1: Subjective cure or improvement in UI: > 3 to 6 months (other data)

Subjective cure or improvement in UI: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Filocamo 2005** | 144/150 | 97/150 | Completely dry or occasional leakage on ICS Male Questionnaire | 6 months | Versus no treatment |
| **Laurienzo 2018** | Median 4.0 (range 0.0-23.0), n = 41 | Median 4.0 (range 0.0-18.0), n = 40 | Urinary symptoms on IPSS, scored between 0 (mild) to 35 (severe) | 6 months | Versus no treatment; not stated whether median and range within text, assumed by review authors |

### Analysis 1.2. Comparison 1: PFMT versus no treatment, sham treatment or verbal/ written instructions, Outcome 2: Subjective cure or improvement in UI: > 6 to 12 months (other data)

Subjective cure or improvement in UI: > 6 to 12 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Filocamo 2005** | 148/150 | 130/148 | Completely dry or occasional leakage on ICS Male Questionnaire | 12 months | Versus no treatment |

### Analysis 1.3. Comparison 1: PFMT versus no treatment, sham treatment or verbal/ written instructions, Outcome 3: Condition-specific quality of life: > 3 to 6 months (other data)

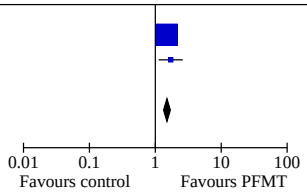
Condition-specific quality of life: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Laurienzo 2018** | Median 3.0 (range 0.0-16.0); n = 41 | Median 4.0 (range 0.0-21.0), n = 40 | ICIQ-SF: scale 0-21, higher score = worse outcomes | 6 months | Versus no treatment; not stated whether median and range within text, assumed by review authors |
| **Moore 1999a** | 3/18 | 3/21 | Symptom Inventory Question 1 (Does urine leakage affect your life?) - number reporting that incontinence affected their lives | 24 weeks | Versus verbal and written instructions; narrative data also presented for IIQ-7 and EORTC QLQ C30 but not separated by groups |
| **Strojek 2021** | Median 6 (IQR 3, range 0-9), n = 19 | Median 9 (IQR 1, range 7-10), n = 15 | EPIC-26 incontinence subcale: lower score = worse result | 12 weeks | Versus no treatment |

## Analysis 1.4. Comparison 1: PFMT versus no treatment, sham treatment or verbal/ written instructions, Outcome 4: Objective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis)

| Study or Subgroup | PFMT Events | PFMT Total | Control Events | Control Total | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|---|
| Filocamo 2005 (1) | 144 | 150 | 97 | 150 | 92.1% | 1.48 [1.31 , 1.68] |
| Manassero 2007 (2) | 37 | 54 | 16 | 40 | 7.9% | 1.71 [1.13 , 2.61] |
| **Total (95% CI)** | | **204** | | **190** | **100.0%** | **1.50 [1.33 , 1.69]** |
| Total events: | 181 | | 113 | | | |

Heterogeneity: Tau² = 0.00; Chi² = 0.46, df = 1 (P = 0.50); I² = 0%
Test for overall effect: Z = 6.76 (P < 0.00001)
Test for subgroup differences: Not applicable





**Footnotes**
(1) 6 months; versus no treatment; unclear whether measured on 1 h or 24 h pad test
(2) 6 months; versus no treatment; 24 h pad test

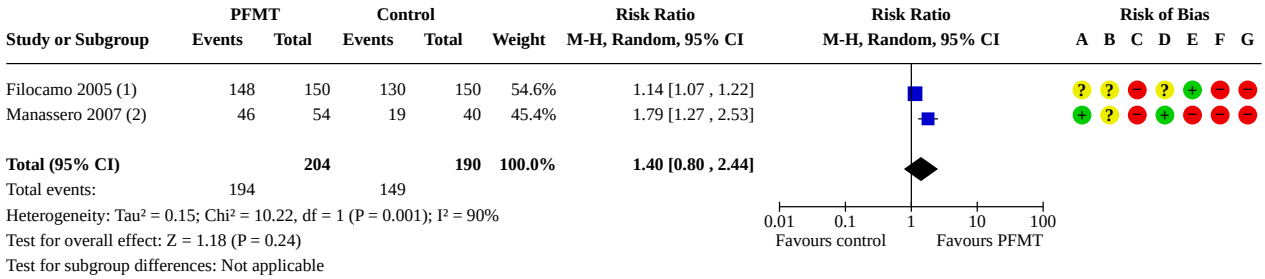
**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 1.5. Comparison 1: PFMT versus no treatment, sham treatment or verbal/ written instructions, Outcome 5: Objective cure or improvement in UI: > 3 to 6 months (other data)

Objective cure or improvement in UI: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Laurienzo 2018** | Median 1.0 (range 0.0-78.0); n = 41 | Median 1.0 (range 0.0-231.0), n = 40 | 1 h pad test | 6 months | Versus no treatment; not stated whether median and range within text, assumed by review authors |
| **Moore 1999a** | 69.9 ± 113.5 (N = 18) | 54.1 ± 103.1 (N = 21) | 24 h pad test | 24 weeks | Versus verbal and written instructions |

## Analysis 1.6. Comparison 1: PFMT versus no treatment, sham treatment or verbal/ written instructions, Outcome 6: Objective cure or improvement in UI: > 6 to 12 months (dichotmous meta-analysis)




**Footnotes**

(1) 12 months; versus no treatment; unclear whether measured on 1 h or 24 h pad test
(2) 12 months; versus no treatment; 24 h pad test

**Risk of bias legend**

(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 1.7. Comparison 1: PFMT versus no treatment, sham treatment or verbal/ written instructions, Outcome 7: Adverse events relating to the viscera or anorectum (other data)

Adverse events relating to the viscera or anorectum (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Moore 1999a** | "One of the men in group 2 complained of rectal pain when doing the exercises and discontinued" | "No others complained of adverse effects from the therapy" | Rectal pain | NR | Versus verbal and written instructions |

## Comparison 2. PFMT plus biofeedback versus no treatment, sham treatment or verbal/ written instructions

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 2.1 Subjective cure or improvement in UI: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 2.2 Subjective cure or improvement in UI: > 6 to 12 months (other data) | 0 | | Other data | No numeric data |
| 2.3 Objective cure or improvement in UI: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 2.4 Objective cure or improvement in UI: > 6 to 12 months (other data) | 0 | | Other data | No numeric data |
| 2.5 Surface or skin-related adverse events (other data) | 0 | | Other data | No numeric data |

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 2.6 General muscle-related adverse events (other data) | 0 | | Other data | No numeric data |
| 2.7 Adverse events relating to the viscera or anorectum (other data) | 0 | | Other data | No numeric data |

### Analysis 2.1. Comparison 2: PFMT plus biofeedback versus no treatment, sham treatment or verbal/written instructions, Outcome 1: Subjective cure or improvement in UI: > 3 to 6 months (other data)

Subjective cure or improvement in UI: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Van Kampen 2000** | 29/50 (57%) | 27/52 (52%) | Subective cure according to a score of 0 on 0-10 VAS scale (0 = continent, 10 = completely incontinent) | 6 months | Versus sham |

### Analysis 2.2. Comparison 2: PFMT plus biofeedback versus no treatment, sham treatment or verbal/written instructions, Outcome 2: Subjective cure or improvement in UI: > 6 to 12 months (other data)

Subjective cure or improvement in UI: > 6 to 12 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Van Kampen 2000** | 26/50 (52%) | 22/52 (42%) | Subjective cure according to a score of 0 on 0-10 VAS scale (0 = continent, 10 = completely incontinent) | 12 months | Versus sham |

### Analysis 2.3. Comparison 2: PFMT plus biofeedback versus no treatment, sham treatment or verbal/written instructions, Outcome 3: Objective cure or improvement in UI: > 3 to 6 months (other data)

Objective cure or improvement in UI: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Moore 2008** | 75.9 ± 259.4 (n = 94)<br>Continent: 41/94 (44%) | 61.1 ± 193.9 (n = 80)<br>Continent: 32/80 (40%) | 24 hour pad test: continence = 8 g or less | 16 weeks | Versus verbal and/or written instructions |
| **Sanchez-Salas 2021** | 21 of 60 (35%) | 32/60 (53%) | No leakage of urine during 3 consecutive days on the 24-hour pad test | 6 months | Versus verbal and/or written instructions |
| **Van Kampen 2000** | 5 g (no SD provided; n = 50) | 3 g (no SD provided; n = 52) | Urine loss on 24 h pad test | 6 months | Versus sham |

### Analysis 2.4. Comparison 2: PFMT plus biofeedback versus no treatment, sham treatment or verbal/written instructions, Outcome 4: Objective cure or improvement in UI: > 6 to 12 months (other data)

Objective cure or improvement in UI: > 6 to 12 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Moore 2008** | 46.5 ± 214.6 (n = 89)<br>Continent: 53/89 (60%) | 8.4 ± 9.7 (n = 78)<br>Continent: 47/78 (64%) | 24 hour pad test: continence = 8 g or less | 1 year | Versus verbal and/or written instructions |
| **Van Kampen 2000** | 8 g (no SD provided; n = 50) | 3 g (no SD provided; n = 52) | Urine loss on 24 h pad test | 12 months | Versus sham |

### Analysis 2.5. Comparison 2: PFMT plus biofeedback versus no treatment, sham treatment or verbal/ written instructions, Outcome 5: Surface or skin-related adverse events (other data)

Surface or skin-related adverse events (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Moore 2008** | "No adverse events were reported during the study" | "No adverse events were reported during the study" | Adverse events | NR | Versus verbal and written instructions |

### Analysis 2.6. Comparison 2: PFMT plus biofeedback versus no treatment, sham treatment or verbal/ written instructions, Outcome 6: General muscle-related adverse events (other data)

General muscle-related adverse events (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Moore 2008** | "No adverse events were reported during the study" | "No adverse events were reported during the study" | Adverse events | NR | Versus verbal and written instructions |

### Analysis 2.7. Comparison 2: PFMT plus biofeedback versus no treatment, sham treatment or verbal/ written instructions, Outcome 7: Adverse events relating to the viscera or anorectum (other data)

Adverse events relating to the viscera or anorectum (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Moore 2008** | "No adverse events were reported during the study" | "No adverse events were reported during the study" | Adverse events | NR | Versus verbal and/or written instructions |

## Comparison 3. Electrical stimulation versus no treatment, sham treatment or verbal/ written instructions

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 3.1 Condition-specific quality of life: > 3 to 6 months | 0 | | Other data | No numeric data |
| 3.2 Objective cure and improvment of UI: > 3 to 6 months | 0 | | Other data | No numeric data |

### Analysis 3.1. Comparison 3: Electrical stimulation versus no treatment, sham treatment or verbal/ written instructions, Outcome 1: Condition-specific quality of life: > 3 to 6 months

Condition-specific quality of life: > 3 to 6 months

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Ahmed 2012** | 23 ± 24 (n = 26) | 25 ± 26 (n = 26) | Modified Arabic IIQ-7: scale 0-100, higher score = worse QoL | 24 weeks | Versus verbal and written instruction |

### Analysis 3.2. Comparison 3: Electrical stimulation versus no treatment, sham treatment or verbal/ written instructions, Outcome 2: Objective cure and improvment of UI: > 3 to 6 months

Objective cure and improvment of UI: > 3 to 6 months

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Ahmed 2012** | 97.8 ± 105.87 (n = 26) | 123 ± 116.53 (n = 26) | 24-hour pad test | 24 weeks | Versus verbal and written instruction |

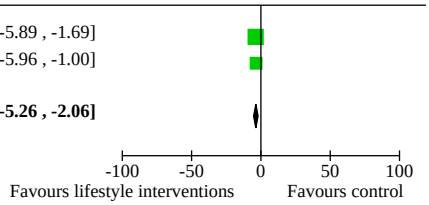
## Comparison 4. Lifestyle interventions versus no treatment, sham treatment or verbal/ written instructions

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 4.1 Condition-specific quality of life: > 3 to 6 months (continuous meta-analysis) | 2 | 126 | Mean Difference (IV, Random, 95% CI) | -3.66 [-5.26, -2.06] |
| 4.2 Condition-specific quality of life: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 4.3 Objective cure or improvement of UI: > 3 to 6 months (dichotomous meta-analysis) | 2 | 126 | Risk Ratio (M-H, Random, 95% CI) | 2.28 [1.38, 3.79] |
| 4.4 Objective cure or improvement in UI: > 3 to 6 months (continuous meta-analysis) | 2 | 126 | Mean Difference (IV, Random, 95% CI) | 17.29 [6.69, 27.90] |

### Analysis 4.1. Comparison 4: Lifestyle interventions versus no treatment, sham treatment or verbal/ written instructions, Outcome 1: Condition-specific quality of life: > 3 to 6 months (continuous meta-analysis)

| | Lifestyle interventions | | | Control | | | | Mean Difference | Mean Difference |
|---|---|---|---|---|---|---|---|---|---|
| Study or Subgroup | Mean | SD | Total | Mean | SD | Total | Weight | IV, Random, 95% CI | IV, Random, 95% CI |
| Gomes 2018 (1) | 4.41 | 4.95 | 34 | 8.2 | 3.87 | 35 | 58.2% | -3.79 [-5.89 , -1.69] | |
| Pedriali 2016 (2) | 4.61 | 5.3 | 26 | 8.09 | 4 | 31 | 41.8% | -3.48 [-5.96 , -1.00] | |
| **Total (95% CI)** | | | **60** | | | **66** | **100.0%** | **-3.66 [-5.26 , -2.06]** | |

Heterogeneity: Tau² = 0.00; Chi² = 0.04, df = 1 (P = 0.85); I² = 0%
Test for overall effect: Z = 4.48 (P < 0.00001)
Test for subgroup differences: Not applicable



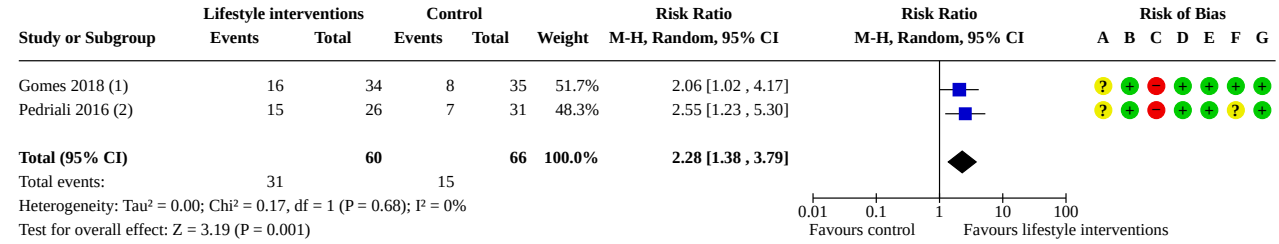

**Footnotes**
(1) Versus no treatment; 4 months; ICIQ-SF score (lower score = improvement)
(2) Versus no treatment; 12 weeks; ICIQ-SF score

### Analysis 4.2. Comparison 4: Lifestyle interventions versus no treatment, sham treatment or verbal/ written instructions, Outcome 2: Condition-specific quality of life: > 3 to 6 months (other data)

Condition-specific quality of life: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Pedriali 2016** | 10/26 (38.5%) | 2/31 (6.5%) | ICIQ-SF: score of 0 (lower score = improvement) | 12 weeks | Versus no treatment |

### Analysis 4.3. Comparison 4: Lifestyle interventions versus no treatment, sham treatment or verbal/ written instructions, Outcome 3: Objective cure or improvement of UI: > 3 to 6 months (dichotomous meta-analysis)



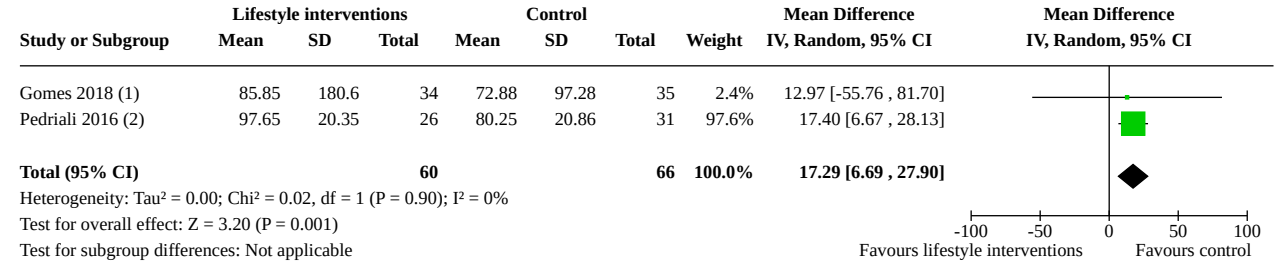

**Footnotes**

(1) Versus no treatment; 4 months; % with < 8 g on 24 h pad test
(2) Versus no treatment; 12 weeks; ICIQ-SF score of 0

**Risk of bias legend**

(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

### Analysis 4.4. Comparison 4: Lifestyle interventions versus no treatment, sham treatment or verbal/ written instructions, Outcome 4: Objective cure or improvement in UI: > 3 to 6 months (continuous meta-analysis)




**Footnotes**

(1) Versus no treatment; 4 months; improvement in 24 h pad test
(2) Versus no treatment; 12 weeks; pad weight on 24 h pad test

## Comparison 5. Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions

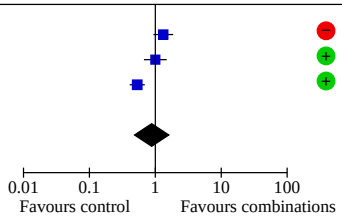
| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 5.1 Subective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis) | 3 | 747 | Risk Ratio (M-H, Random, 95% CI) | 0.88 [0.48, 1.60] |
| 5.2 Subjective cure or improvement in UI: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 5.3 Subective cure or improvement in UI: > 6 to 12 months (dichotomous meta-analysis) | 2 | 788 | Risk Ratio (M-H, Random, 95% CI) | 0.97 [0.79, 1.19] |

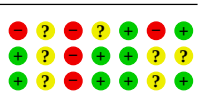
| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 5.4 Condition-specific quality of life: > 3 to 6 months (dichotomous meta-analysis) | 2 | 99 | Risk Ratio (M-H, Random, 95% CI) | 2.96 [1.15, 7.61] |
| 5.5 Condition-specific quality of life: > 3 to 6 months (continuous meta-analysis) | 5 | 977 | Std. Mean Difference (IV, Random, 95% CI) | -0.22 [-0.44, 0.01] |
| 5.6 Condition-specific quality of life: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 5.7 Condition-specific quality of life: > 6 to 12 months (continuous meta-analysis) | 2 | 788 | Mean Difference (IV, Random, 95% CI) | -0.28 [-0.86, 0.29] |
| 5.8 Objective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis) | 3 | 183 | Risk Ratio (M-H, Random, 95% CI) | 1.55 [1.20, 2.00] |
| 5.9 Objective cure or improvement in UI: > 3 to 6 months (continuous meta-analysis) | 6 | 815 | Std. Mean Difference (IV, Random, 95% CI) | -0.21 [-0.47, 0.05] |
| 5.10 Objective cure or improvement in UI: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 5.11 Objective cure or improvement in UI: > 6 to 12 months (continuous meta-analysis) | 2 | 565 | Mean Difference (IV, Random, 95% CI) | 0.18 [-0.24, 0.60] |
| 5.12 Adherence to treatment: > 3 to 6 months (dichotomous meta-analysis) | 2 | 781 | Risk Ratio (M-H, Random, 95% CI) | 1.54 [1.22, 1.93] |
| 5.13 Adherence to treatment: > 3 to 6 months (continuous meta-analysis) | 2 | 755 | Mean Difference (IV, Random, 95% CI) | 3.91 [-8.40, 16.21] |
| 5.14 Adherence to treatment: > 6 to 12 months (dichotomous meta-analysis) | 2 | 763 | Risk Ratio (M-H, Random, 95% CI) | 2.08 [0.78, 5.56] |
| 5.15 Adherence to treatment: > 6 to 12 months (continuous meta-analysis) | 2 | 762 | Mean Difference (IV, Random, 95% CI) | 0.79 [-13.66, 15.25] |
| 5.16 General quality of life: > 3 to 6 months (continuous meta-analysis) | 2 | 746 | Mean Difference (IV, Random, 95% CI) | -0.01 [-0.04, 0.03] |
| 5.17 General quality of life: > 6 to 12 months (continuous meta-analysis) | 2 | 742 | Mean Difference (IV, Random, 95% CI) | -0.01 [-0.04, 0.02] |
| 5.18 Surface or skin-related adverse events (other data) | 0 | | Other data | No numeric data |
| 5.19 General muscle-related adverse events (dichotomous meta-analysis) | 2 | 136 | Risk Ratio (M-H, Random, 95% CI) | 2.92 [0.31, 27.41] |
| 5.20 General muscle-related adverse events (other data) | 0 | | Other data | No numeric data |
| 5.21 Adverse events relating to the viscera or anorectum (other data) | 0 | | Other data | No numeric data |

## Analysis 5.1. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 1: Subective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis)

| Study or Subgroup | Combination Events | Combination Total | Control Events | Control Total | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|---|
| Chen 2013 (1) | 13 | 13 | 9 | 12 | 33.2% | 1.32 [0.93 , 1.86] |
| Glazener 2011a (2) | 39 | 197 | 39 | 197 | 32.0% | 1.00 [0.67 , 1.49] |
| Glazener 2011b (2) | 59 | 199 | 72 | 129 | 34.8% | 0.53 [0.41 , 0.69] |
| **Total (95% CI)** | | **409** | | **338** | **100.0%** | **0.88 [0.48 , 1.60]** |
| Total events: | 111 | | 120 | | | |

Heterogeneity: Tau² = 0.25; Chi² = 19.52, df = 2 (P < 0.0001); I² = 90%
Test for overall effect: Z = 0.42 (P = 0.68)
Test for subgroup differences: Not applicable




**Footnotes**
(1) Versus no treatment; 6 months
(2) Versus no treatment; 6 months; based on two questions from ICI-SF

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.2. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 2: Subjective cure or improvement in UI: > 3 to 6 months (other data)

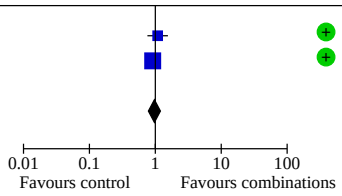
Subjective cure or improvement in UI: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Laurienzo 2018** | Median 2.5 (range 0.0-27.0), n = 42 | Median 4.0 (range 0.0-18.0), n = 40 | IPSS score: scale 0-35, higher score = worse outcome | 6 months | Versus no treatment; median and range assumed statistics, not reported in text |

## Analysis 5.3. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 3: Subective cure or improvement in UI: > 6 to 12 months (dichotomous meta-analysis)

| Study or Subgroup | Combination Events | Combination Total | Control Events | Control Total | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|---|
| Glazener 2011a (1) | 48 | 196 | 44 | 195 | 34.4% | 1.09 [0.76 , 1.55] |
| Glazener 2011b (1) | 68 | 194 | 78 | 203 | 65.6% | 0.91 [0.70 , 1.18] |
| **Total (95% CI)** | | **390** | | **398** | **100.0%** | **0.97 [0.79 , 1.19]** |
| Total events: | 116 | | 122 | | | |

Heterogeneity: Tau² = 0.00; Chi² = 0.60, df = 1 (P = 0.44); I² = 0%
Test for overall effect: Z = 0.30 (P = 0.76)
Test for subgroup differences: Not applicable





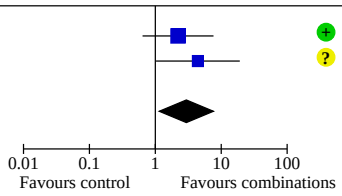
**Footnotes**
(1) Versus no treatment; 12 months; based on two questions from ICI-SF

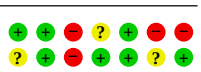
**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.4. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 4: Condition-specific quality of life: > 3 to 6 months (dichotomous meta-analysis)

| Study or Subgroup | Combination Events | Combination Total | Control Events | Control Total | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|---|
| Moore 1999a (1) | 6 | 19 | 3 | 21 | 58.2% | 2.21 [0.64 , 7.63] |
| Pedriali 2016 (2) | 8 | 28 | 2 | 31 | 41.8% | 4.43 [1.03 , 19.12] |
| **Total (95% CI)** | | **47** | | **52** | **100.0%** | **2.96 [1.15 , 7.61]** |
| Total events: | 14 | | 5 | | | |

Heterogeneity: Tau² = 0.00; Chi² = 0.51, df = 1 (P = 0.47); I² = 0%
Test for overall effect: Z = 2.25 (P = 0.02)
Test for subgroup differences: Not applicable



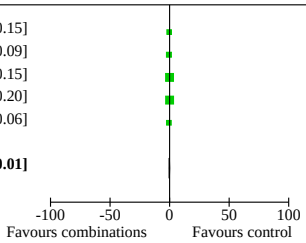

**Footnotes**
(1) Versus verbal and written instruction; 24 weeks; Symptom Inventory Question 1 (Does urine leakage affect your life?) - number reporting that incontinence affected their lives
(2) Versus no treatment; 12 weeks; ICIQ-SF score of 0

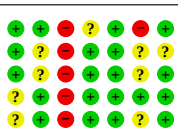
**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.5. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 5: Condition-specific quality of life: > 3 to 6 months (continuous meta-analysis)

| Study or Subgroup | Combinations Mean | SD | Total | Control Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Ahmed 2012 (1) | 15 | 25 | 28 | 25 | 26 | 26 | 12.2% | -0.39 [-0.93 , 0.15] |
| Glazener 2011a (2) | 5.77 | 4.54 | 35 | 8.2 | 3.87 | 35 | 14.3% | -0.57 [-1.05 , -0.09] |
| Glazener 2011b (2) | 5.4 | 4.2 | 197 | 5.6 | 4.6 | 197 | 30.3% | -0.05 [-0.24 , 0.15] |
| Gomes 2018 (3) | 4.1 | 3.7 | 199 | 4.1 | 4.3 | 201 | 30.4% | 0.00 [-0.20 , 0.20] |
| Pedriali 2016 (4) | 5.6 | 4.39 | 28 | 8.09 | 4 | 31 | 12.7% | -0.59 [-1.11 , -0.06] |
| **Total (95% CI)** | | | **487** | | | **490** | **100.0%** | **-0.22 [-0.44 , 0.01]** |

Heterogeneity: Tau² = 0.03; Chi² = 9.37, df = 4 (P = 0.05); I² = 57%
Test for overall effect: Z = 1.88 (P = 0.06)
Test for subgroup differences: Not applicable




**Footnotes**
(1) Versus verbal/written instruction; 24 weeks; IIQ-7, 0-100, higher score = worse QoL
(2) Versus no treatment; 6 months; ICIQ-Q, 0-21, higher score = worse QoL
(3) Versus no treatment; 4 months; ICIQ-SF, higher score = worse QoL
(4) Versus no treatment; 12 weeks; ICIQ-SF score

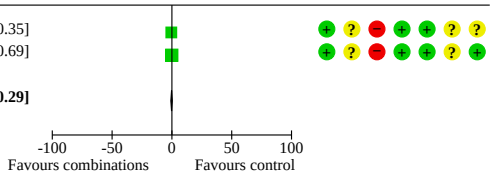
**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.6. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 6: Condition-specific quality of life: > 3 to 6 months (other data)

Condition-specific quality of life: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Laurienzo 2018** | Median 4.0 (range 0.0-18.0), n = 42 | Median 4.0 (range 0.0-21.0), n = 40 | ICIQ-SF: scale 0-21, higher score = worse QoL | 6 months | Versus no treatment; median and range assumed statistics, not reported in text |

## Analysis 5.7. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 7: Condition-specific quality of life: > 6 to 12 months (continuous meta-analysis)



| Study or Subgroup | Combinations Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI |
|---|---|---|---|---|---|---|---|---|
| Glazener 2011a (1) | 4.9 | 4.1 | 196 | 5.4 | 4.5 | 195 | 46.0% | -0.50 [-1.35 , 0.35] |
| Glazener 2011b (1) | 3.9 | 3.7 | 194 | 4 | 4.3 | 203 | 54.0% | -0.10 [-0.89 , 0.69] |
| **Total (95% CI)** | | | **390** | | | **398** | **100.0%** | **-0.28 [-0.86 , 0.29]** |

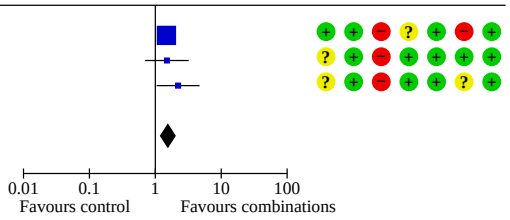
Heterogeneity: Tau² = 0.00; Chi² = 0.46, df = 1 (P = 0.50); I² = 0%
Test for overall effect: Z = 0.96 (P = 0.34)
Test for subgroup differences: Not applicable



**Footnotes**
(1) Versus no treatment; 12 months; ICIQ-Q, 0-21, higher score = worse QoL

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.8. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 8: Objective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis)



| Study or Subgroup | Combination Events | Total | Control Events | Total | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|---|
| Ahmed 2012 (1) | 27 | 28 | 17 | 26 | 77.4% | 1.47 [1.11 , 1.97] |
| Gomes 2018 (2) | 12 | 35 | 8 | 35 | 11.1% | 1.50 [0.70 , 3.21] |
| Pedriali 2016 (3) | 14 | 28 | 7 | 31 | 11.5% | 2.21 [1.05 , 4.69] |
| **Total (95% CI)** | | **91** | | **92** | **100.0%** | **1.55 [1.20 , 2.00]** |
| Total events: | 53 | | 32 | | | |

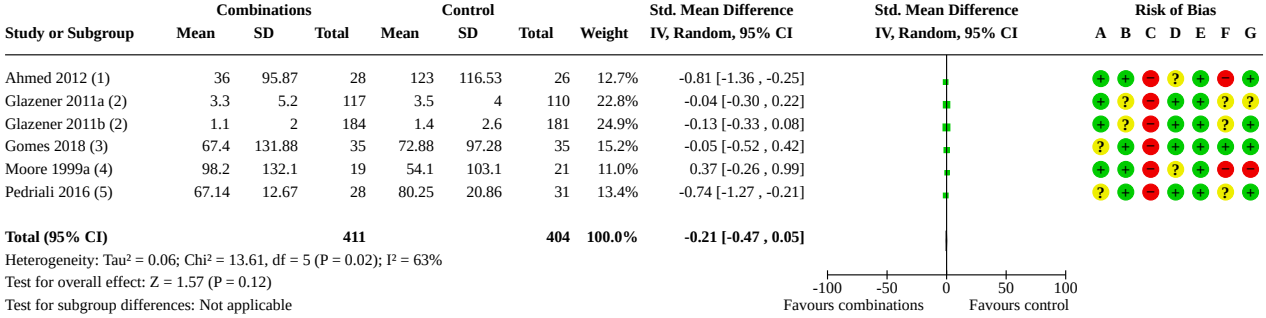
Heterogeneity: Tau² = 0.00; Chi² = 1.16, df = 2 (P = 0.56); I² = 0%
Test for overall effect: Z = 3.37 (P = 0.0007)
Test for subgroup differences: Not applicable



**Footnotes**
(1) Versus verbal/written instruction; 24 weeks; continence rate (%, imputed)
(2) Versus no treatment; 4 months; % with < 8 g on 24 hour pad test
(3) Versus no treatment; 12 weeks; continent according to no pad use

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.9. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 9: Objective cure or improvement in UI: > 3 to 6 months (continuous meta-analysis)




**Footnotes**

(1) Versus verbal/written instruction; 24 weeks; 24 h pad test
(2) Versus no treatment; 6 months; frequency of daytime UI from diaires
(3) Versus no treatment; 4 months; 24 h pad test
(4) Versus verbal/written instruction; 24 weeks; urine loss on 24 h pad test
(5) Versus no treatment; 12 weeks; pad weight on 24 h pad test

**Risk of bias legend**

(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.10. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 10: Objective cure or improvement in UI: > 3 to 6 months (other data)

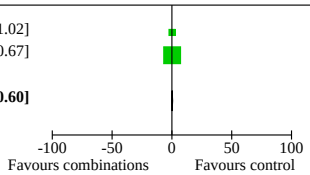
Objective cure or improvement in UI: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Franke 2000** | 8 g (n = NR) | 62 g (n = NR) | Mean incontinence weight gm/24 hours on pad test | 6 months | Versus no treatment; SD not provided |
| **Laurienzo 2018** | Median 4.0 (range 0.0-18.0), n = 42 | Median 4.0 (range 0.0-21.0), n = 40 | ICIQ-SF: scale 0-21, higher score = worse QoL | 6 months | Versus no treatment; median and range assumed statistics, not reported in text |

## Analysis 5.11. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 11: Objective cure or improvement in UI: > 6 to 12 months (continuous meta-analysis)

| Study or Subgroup | Combinations Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|---|---|
| Glazener 2011a (1) | 3 | 3.8 | 105 | 2.9 | 3 | 106 | 20.5% | 0.10 [-0.82 , 1.02] | + ? − + + ? ? |
| Glazener 2011b (1) | 1.4 | 2.3 | 175 | 1.2 | 2.2 | 179 | 79.5% | 0.20 [-0.27 , 0.67] | + ? − + + ? + |
| **Total (95% CI)** | | | **280** | | | **285** | **100.0%** | **0.18 [-0.24 , 0.60]** | |

Heterogeneity: Tau² = 0.00; Chi² = 0.04, df = 1 (P = 0.85); I² = 0%
Test for overall effect: Z = 0.84 (P = 0.40)
Test for subgroup differences: Not applicable



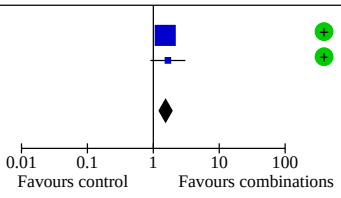

**Footnotes**
(1) Versus no treatment; 12 months; frequency of daytime UI from diaires

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.12. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 12: Adherence to treatment: > 3 to 6 months (dichotomous meta-analysis)

| Study or Subgroup | Combination Events | Total | Control Events | Total | Weight | Risk Ratio M-H, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|
| Glazener 2011a (1) | 96 | 188 | 64 | 190 | 86.3% | 1.52 [1.19 , 1.93] | + ? − + + ? ? |
| Glazener 2011b (1) | 28 | 220 | 14 | 183 | 13.7% | 1.66 [0.90 , 3.06] | + ? − + + ? + |
| **Total (95% CI)** | | **408** | | **373** | **100.0%** | **1.54 [1.22 , 1.93]** | |
| Total events: | 124 | | 78 | | | | |

Heterogeneity: Tau² = 0.00; Chi² = 0.08, df = 1 (P = 0.78); I² = 0%
Test for overall effect: Z = 3.71 (P = 0.0002)
Test for subgroup differences: Not applicable



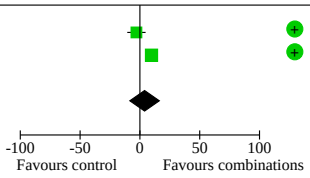

**Footnotes**
(1) Versus no treatment; 6 months; undertaking PFMT every day in past week

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.13. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 13: Adherence to treatment: > 3 to 6 months (continuous meta-analysis)

| Study or Subgroup | Combinations Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|---|---|
| Glazener 2011a (1) | 18.2 | 29.4 | 188 | 21.1 | 45 | 190 | 46.0% | -2.90 [-10.56 , 4.76] | + ? − + + ? ? |
| Glazener 2011b (1) | 12.4 | 19.2 | 194 | 2.7 | 10.6 | 183 | 54.0% | 9.70 [6.59 , 12.81] | + ? − + + ? + |
| **Total (95% CI)** | | | **382** | | | **373** | **100.0%** | **3.91 [-8.40 , 16.21]** | |

Heterogeneity: Tau² = 70.50; Chi² = 8.93, df = 1 (P = 0.003); I² = 89%
Test for overall effect: Z = 0.62 (P = 0.53)
Test for subgroup differences: Not applicable



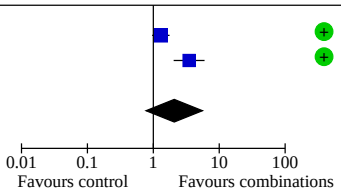

**Footnotes**
(1) Versus no treatment; 12 months; average number of contractions

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.14. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 14: Adherence to treatment: > 6 to 12 months (dichotomous meta-analysis)

| Study or Subgroup | Combination Events | Total | Control Events | Total | Weight | Risk Ratio M-H, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|
| Glazener 2011a (1) | 67 | 192 | 51 | 190 | 52.6% | 1.30 [0.96 , 1.76] | + ? − + + ? ? |
| Glazener 2011b (1) | 51 | 188 | 15 | 193 | 47.4% | 3.49 [2.04 , 5.99] | + ? − + + ? + |
| **Total (95% CI)** | | **380** | | **383** | **100.0%** | **2.08 [0.78 , 5.56]** | |
| Total events: | 118 | | 66 | | | | |

Heterogeneity: Tau² = 0.46; Chi² = 10.14, df = 1 (P = 0.001); I² = 90%
Test for overall effect: Z = 1.45 (P = 0.15)
Test for subgroup differences: Not applicable



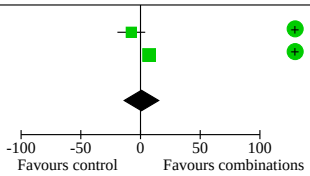

**Footnotes**
(1) Versus no treatment; 12 months; undertaking PFMT every day in past week

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.15. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 15: Adherence to treatment: > 6 to 12 months (continuous meta-analysis)

| Study or Subgroup | Combinations Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|---|---|
| Glazener 2011a (1) | 11.7 | 20 | 192 | 19.4 | 79.2 | 189 | 43.0% | -7.70 [-19.34 , 3.94] | + ? − + + ? ? |
| Glazener 2011b (1) | 11.5 | 22.8 | 188 | 4.3 | 16.4 | 193 | 57.0% | 7.20 [3.20 , 11.20] | + ? − + + ? + |
| **Total (95% CI)** | | | **380** | | | **382** | **100.0%** | **0.79 [-13.66 , 15.25]** | |

Heterogeneity: Tau² = 91.29; Chi² = 5.63, df = 1 (P = 0.02); I² = 82%
Test for overall effect: Z = 0.11 (P = 0.91)
Test for subgroup differences: Not applicable



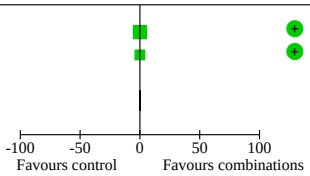

**Footnotes**
(1) Versus no treatment; 12 months; average number of contractions

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.16. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 16: General quality of life: > 3 to 6 months (continuous meta-analysis)

| Study or Subgroup | Combinations Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|---|---|
| Glazener 2011a (1) | 0.884 | 0.205 | 184 | 0.875 | 0.189 | 189 | 59.5% | 0.01 [-0.03 , 0.05] | + ? − + + ? ? |
| Glazener 2011b (1) | 0.8 | 0.257 | 188 | 0.826 | 0.235 | 185 | 40.5% | -0.03 [-0.08 , 0.02] | + ? − + + ? + |
| **Total (95% CI)** | | | **372** | | | **374** | **100.0%** | **-0.01 [-0.04 , 0.03]** | |

Heterogeneity: Tau² = 0.00; Chi² = 1.15, df = 1 (P = 0.28); I² = 13%
Test for overall effect: Z = 0.30 (P = 0.76)
Test for subgroup differences: Not applicable



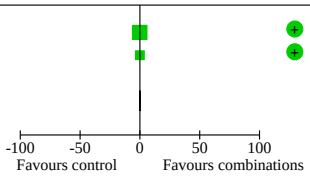

**Footnotes**
(1) Versus no treatment; 6 months; EQ-5D (higher score = better health)

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.17. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 17: General quality of life: > 6 to 12 months (continuous meta-analysis)

| Study or Subgroup | Combinations Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|---|---|
| Glazener 2011a (1) | 0.879 | 0.209 | 187 | 0.887 | 0.176 | 189 | 64.6% | -0.01 [-0.05 , 0.03] | + ? − + + ? ? |
| Glazener 2011b (1) | 0.784 | 0.249 | 177 | 0.791 | 0.266 | 189 | 35.4% | -0.01 [-0.06 , 0.05] | + ? − + + ? + |
| **Total (95% CI)** | | | **364** | | | **378** | **100.0%** | **-0.01 [-0.04 , 0.02]** | |

Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.98); I² = 0%
Test for overall effect: Z = 0.48 (P = 0.63)
Test for subgroup differences: Not applicable




**Footnotes**
(1) Versus no treatment; 12 months; EQ-5D (higher score = better health)

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 5.18. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 18: Surface or skin-related adverse events (other data)

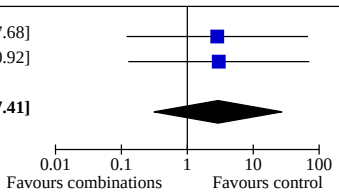
Surface or skin-related adverse events (other data)

| Study | Intervention | Control | Assessment tool | Time-point | Notes |
|---|---|---|---|---|---|
| **Glazener 2011a** | "No adverse effects were reported by any participant in the trials." | "No adverse effects were reported by any participant in the trials." | Adverse effects | NR | Versus no treatment |
| **Glazener 2011b** | "No adverse effects were reported by any participant in the trials." | "No adverse effects were reported by any participant in the trials." | Adverse effects | NR | Versus no treatment |

## Analysis 5.19. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 19: General muscle-related adverse events (dichotomous meta-analysis)

| Study or Subgroup | Combination Events | Total | Control Events | Total | Weight | Risk Ratio M-H, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|
| Gomes 2018 (1) | 1 | 38 | 0 | 36 | 49.9% | 2.85 [0.12 , 67.68] | ? + − + + + + |
| Pedriali 2016 (2) | 1 | 31 | 0 | 31 | 50.1% | 3.00 [0.13 , 70.92] | ? + − + + ? + |
| **Total (95% CI)** | | **69** | | **67** | **100.0%** | **2.92 [0.31 , 27.41]** | |
| Total events: | 2 | | 0 | | | | |

Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.98); I² = 0%
Test for overall effect: Z = 0.94 (P = 0.35)
Test for subgroup differences: Not applicable




**Footnotes**
(1) Discomfort due to treatment
(2) Discomfort

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

### Analysis 5.20. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 20: General muscle-related adverse events (other data)

General muscle-related adverse events (other data)

| Study | Intervention | Control | Assessment tool | Time-point | Notes |
|---|---|---|---|---|---|
| **Glazener 2011a** | "No adverse effects were reported by any participant in the trials." | "No adverse effects were reported by any participant in the trials." | Adverse effects | NR | Versus no treatment |
| **Glazener 2011b** | "No adverse effects were reported by any participant in the trials." | "No adverse effects were reported by any participant in the trials." | Adverse effects | NR | Versus no treatment |

### Analysis 5.21. Comparison 5: Combinations of conservative treatments versus no treatment, sham treatment or verbal/ written instructions, Outcome 21: Adverse events relating to the viscera or anorectum (other data)

Adverse events relating to the viscera or anorectum (other data)

| Study | Intervention | Control | Assessment tool | Time-point | Notes |
|---|---|---|---|---|---|
| **Glazener 2011a** | "No adverse effects were reported by any participant in the trials." | "No adverse effects were reported by any participant in the trials." | Adverse effects | NR | Versus no treatment |
| **Glazener 2011b** | "No adverse effects were reported by any participant in the trials." | "No adverse effects were reported by any participant in the trials." | Adverse effects | NR | Versus no treatment |
| **Goode 2011** | 2/70 | 0/34 | Haemorrhoidal irritation | NR | Versus no treatment; PFMT + bladder training + fluid management + biofeedback + electrical stimulation versus control; control number halved to avoid double counting |
| **Goode 2011** | 0/70 | 0/34 | Haemorrhoidal irritation | NR | Versus no treatment; PFMT + bladder training + fluid management versus control; control number halved to avoid double-counting |
| **Moore 1999a** | "No others complained of adverse effects from the therapy" | "No others complained of adverse effects from the therapy" | Rectal pain | NR | Versus verbal/ written instruction |

## Comparison 6. PFMT plus electrical stimulation versus PFMT alone

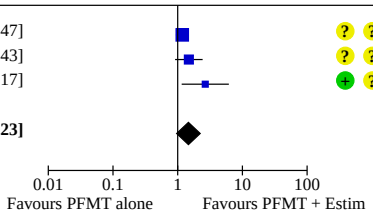
| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 6.1 Subective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis) | 3 | 139 | Risk Ratio (M-H, Random, 95% CI) | 1.46 [0.96, 2.23] |
| 6.2 Subjective cure or improvement in UI: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 6.3 Subjective cure or improvement in UI: > 6 to 12 months (continuous meta-analysis) | 2 | 65 | Std. Mean Difference (IV, Random, 95% CI) | -0.06 [-0.56, 0.43] |
| 6.4 Subjective cure or improvement in UI: > 6 to 12 months (other data) | 0 | | Other data | No numeric data |

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 6.5 Condition-specific quality of life: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 6.6 Condition-specific quality of life: > 6 to 12 months (continuous meta-analysis) | 2 | 65 | Std. Mean Difference (IV, Random, 95% CI) | 0.05 [-0.51, 0.62] |
| 6.7 Condition-specific quality of life: > 6 to 12 months (other data) | 0 | | Other data | No numeric data |
| 6.8 Objective cure or improvement in UI: > 3 to 6 months (continuous meta-analysis) | 2 | 86 | Mean Difference (IV, Random, 95% CI) | -35.69 [-172.93, 101.54] |
| 6.9 Objective cure or improvement in UI: > 3 to 6 months (other data) | 0 | | Other data | No numeric data |
| 6.10 Objective cure or improvement in UI: > 6 to 12 months (continuous meta-analysis) | 2 | 65 | Std. Mean Difference (IV, Random, 95% CI) | 0.06 [-0.94, 1.07] |
| 6.11 Objective cure or improvement in UI: > 6 to 12 months (other data) | 0 | | Other data | No numeric data |
| 6.12 Surface or skin-related adverse events (other data) | 0 | | Other data | No numeric data |
| 6.13 General muscle-related adverse events (other data) | 0 | | Other data | No numeric data |
| 6.14 Adverse events relating to the viscera or anorectum (dichotomous meta-analysis) | 2 | 93 | Risk Ratio (M-H, Random, 95% CI) | 1.04 [0.04, 29.33] |
| 6.15 Adverse events relating to the viscera or anorectum (other data) | 0 | | Other data | No numeric data |

## Analysis 6.1. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 1: Subective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis)

| Study or Subgroup | PFMT + Estim Events | PFMT + Estim Total | PFMT alone Events | PFMT alone Total | Weight | Risk Ratio M-H, Random, 95% CI | Risk of Bias A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ceresoli 2002 (1) | 30 | 34 | 27 | 36 | 50.1% | 1.18 [0.94 , 1.47] | ? | ? | − | ? | ? | − | ? |
| Morihiro 2011 (2) | 17 | 20 | 8 | 14 | 32.5% | 1.49 [0.91 , 2.43] | ? | ? | − | ? | ? | − | ? |
| Zaidan de Barros 2014 (3) | 10 | 15 | 5 | 20 | 17.4% | 2.67 [1.15 , 6.17] | + | ? | − | ? | + | − | + |
| **Total (95% CI)** | | **69** | | **70** | **100.0%** | **1.46 [0.96 , 2.23]** | | | | | | | |
| Total events: | 57 | | 40 | | | | | | | | | | |

Heterogeneity: Tau² = 0.08; Chi² = 4.74, df = 2 (P = 0.09); I² = 58%
Test for overall effect: Z = 1.79 (P = 0.07)
Test for subgroup differences: Not applicable




**Footnotes**
(1) 6 months; defined according to Catalona's definition
(2) 6 months; defined according to no need for pads to keep clothing dry
(3) 3 months; continent as defined by no use of pads

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 6.2. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 2: Subjective cure or improvement in UI: > 3 to 6 months (other data)

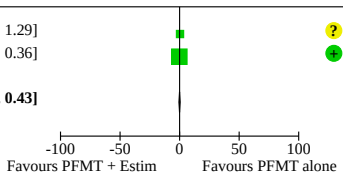
Subjective cure or improvement in UI: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Laurienzo 2018** | Median 2.5 (range 0.0-27.0), n = 42 | Median 4.0 (0.0-23.0), n = 41 | IPSS score: scale 0-35, higher score = worse outcome | 6 months | Statistic type not reported in text; assumed median, minimum maximum |
| **Yamanishi 2010** | 4.3 ± 6.2 (n = 22) | 8.2 ± 5.3 (n = 25) | Total ICIQ-SF score | 6 months | |

## Analysis 6.3. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 3: Subjective cure or improvement in UI: > 6 to 12 months (continuous meta-analysis)

| Study or Subgroup | PFMT + Estim Mean | SD | Total | PFMT alone Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|---|---|
| Kakihara 2007 (1) | 3.4 | 2.2 | 8 | 2.8 | 1 | 10 | 27.6% | 0.35 [-0.59 , 1.29] | ? ? − ? − − ? |
| Yamanishi 2010 (2) | 4.2 | 6.2 | 22 | 5.6 | 6.5 | 25 | 72.4% | -0.22 [-0.79 , 0.36] | + + ? ? + ? + |
| **Total (95% CI)** | | | **30** | | | **35** | **100.0%** | **-0.06 [-0.56 , 0.43]** | |

Heterogeneity: Tau² = 0.00; Chi² = 1.01, df = 1 (P = 0.31); I² = 1%
Test for overall effect: Z = 0.24 (P = 0.81)
Test for subgroup differences: Not applicable




**Footnotes**
(1) 12 months; "Incontinence VAS", scale 0-10, higher score = worse outcome
(2) 12 months; Total ICIQ-SF score

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 6.4. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 4: Subjective cure or improvement in UI: > 6 to 12 months (other data)

Subjective cure or improvement in UI: > 6 to 12 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Morihiro 2011** | 20/20 | 9/14 | Continence rate as defined by no need to use a pad to keep clothing dry | 12 months | |

## Analysis 6.5. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 5: Condition-specific quality of life: > 3 to 6 months (other data)

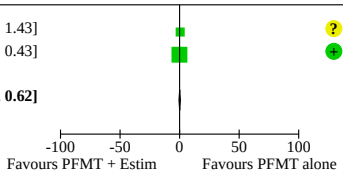
Condition-specific quality of life: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Laurienzo 2018** | Median 4.0 (range 0.0-18.0), n = 42 | Median 3.0 (range 0.0-16.0), n = 41 | ICIQ-SF score: scale 0-21, higher score = worse outcome | 6 months | Statistic type not reported in text; assumed median, minimum maximum |
| **Moore 1999a** | 13/19 | 15/18 | Symptom Inventory Question 1 (Does urine leakage affect your life?) - number reporting that incontinence affected their lives | 24 weeks | Narrative data also presented for IIQ-7 and EORTC QLQ C30 but not separated by groups |
| **Yamanishi 2010** | 1.6 ± 3.1 (n = 22) | 2.5 ± 2.2 (n = 25) | ICIQ-SF QoL score: higher score = worse outcome | 6 months | |

## Analysis 6.6. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 6: Condition-specific quality of life: > 6 to 12 months (continuous meta-analysis)

| Study or Subgroup | PFMT + Estim Mean | SD | Total | PFMT alone Mean | SD | Total | Weight | Std. Mean Difference IV, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|---|---|
| Kakihara 2007 (1) | 3.5 | 2.3 | 8 | 2.6 | 1.2 | 10 | 31.1% | 0.48 [-0.46 , 1.43] | ? ? - ? - - ? |
| Yamanishi 2010 (2) | 1.5 | 3.1 | 22 | 1.9 | 2.5 | 25 | 68.9% | -0.14 [-0.71 , 0.43] | + + ? ? + ? + |
| **Total (95% CI)** | | | **30** | | | **35** | **100.0%** | **0.05 [-0.51 , 0.62]** | |

Heterogeneity: Tau² = 0.04; Chi² = 1.23, df = 1 (P = 0.27); I² = 18%
Test for overall effect: Z = 0.19 (P = 0.85)
Test for subgroup differences: Not applicable




**Footnotes**
(1) 12 months; "problem VAS", scale 0-10, higher score = worse outcome
(2) 12 months; ICIQ-SF QoL score, higher score = worse outcome

**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 6.7. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 7: Condition-specific quality of life: > 6 to 12 months (other data)

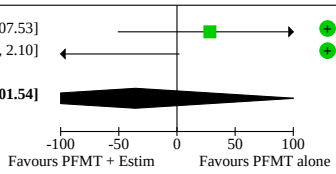
Condition-specific quality of life: > 6 to 12 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Yamanishi 2010** | "At the end of treatment (usually at 12 months) a significant decrease was noted in every domain of the KHQ score except for personal relationships in both groups (see figure)." | "At the end of treatment (usually at 12 months) a significant decrease was noted in every domain of the KHQ score except for personal relationships in both groups (see figure)." | KHQ | End of treatment ("usually" 12 months) | Only figure presented, no narrative results or table |

## Analysis 6.8. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 8: Objective cure or improvement in UI: > 3 to 6 months (continuous meta-analysis)

| Study or Subgroup | PFMT + Estim Mean | SD | Total | PFMT alone Mean | SD | Total | Weight | Mean Difference IV, Random, 95% CI | Risk of Bias A B C D E F G |
|---|---|---|---|---|---|---|---|---|---|
| Moore 1999a (1) | 98.2 | 132.1 | 19 | 69.9 | 113.5 | 18 | 54.5% | 28.30 [-50.93 , 107.53] | + + - ? + - - |
| Yamanishi 2010 (2) | 20.1 | 49.2 | 23 | 132.4 | 293 | 26 | 45.5% | -112.30 [-226.70 , 2.10] | + + ? ? + ? + |
| **Total (95% CI)** | | | **42** | | | **44** | **100.0%** | **-35.69 [-172.93 , 101.54]** | |

Heterogeneity: Tau² = 7363.55; Chi² = 3.92, df = 1 (P = 0.05); I² = 74%
Test for overall effect: Z = 0.51 (P = 0.61)
Test for subgroup differences: Not applicable




**Footnotes**
(1) 24 weeks; urine loss on 24 h pad test (g)
(2) 6 months; 24 h pad test, g leakage

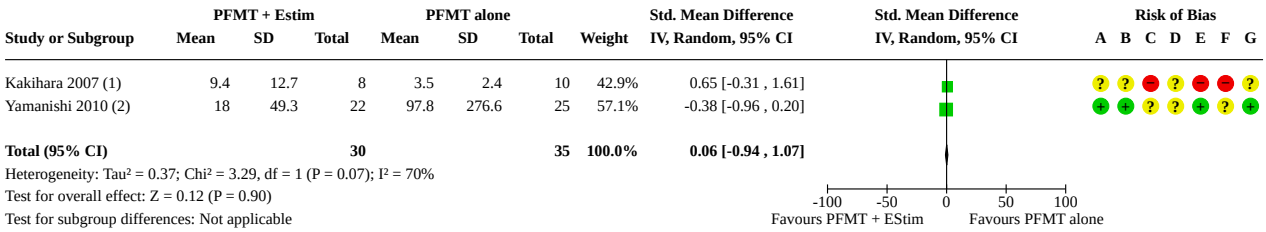
**Risk of bias legend**
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 6.9. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 9: Objective cure or improvement in UI: > 3 to 6 months (other data)

Objective cure or improvement in UI: > 3 to 6 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Ceresoli 2002** | 1.5 (n = 36) | 1 (n = 34) | Mean number of pads | 6 months | No SD provided |
| **Laurienzo 2018** | Median 1.0 (range 0.0-183.0), n = 42 | Median 1.0 (range 0.0-78.0), n = 41 | 1 h pad test | 6 months | Statistics not reported in text; assumed median, minumum and maximum values |
| **Yamanishi 2010** | 18/22 | 11/25 | Continent according to < 8 g leakage on 24 h pad test | 6 months | |

## Analysis 6.10. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 10: Objective cure or improvement in UI: > 6 to 12 months (continuous meta-analysis)




**Footnotes**

(1) 12 months; 1 hour pad test
(2) 12 months; 24 h pad test, g leakage

**Risk of bias legend**

(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

## Analysis 6.11. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 11: Objective cure or improvement in UI: > 6 to 12 months (other data)

Objective cure or improvement in UI: > 6 to 12 months (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Yamanishi 2010** | 19/22 (86%) | 17/19 (86%) | Continent according to < 8 g leakage on 24 h pad test | 12 months | |

## Analysis 6.12. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 12: Surface or skin-related adverse events (other data)

Surface or skin-related adverse events (other data)

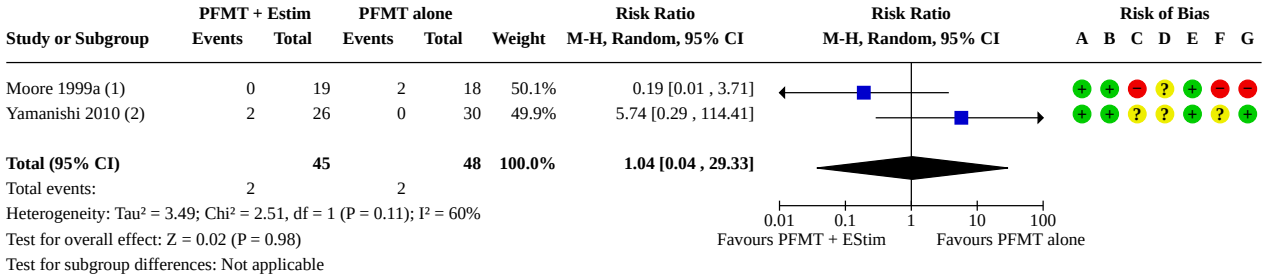
| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Morihiro 2011** | "No remarkable adverse event was observed during the study period." | "No remarkable adverse event was observed during the study period." | Adverse events | NR | |

### Analysis 6.13. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 13: General muscle-related adverse events (other data)

General muscle-related adverse events (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Morihiro 2011** | "No remarkable adverse event was observed during the study period." | "No remarkable adverse event was observed during the study period." | Adverse events | NR | |
| **Yamanishi 2010** | 2/26 | 4/30 | Discomfort or anal pain due to electrical stimulation | NR | |

### Analysis 6.14. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 14: Adverse events relating to the viscera or anorectum (dichotomous meta-analysis)




**Footnotes**

(1) Rectal pain when doing exercises
(2) Urethral stricture at the bladder neck

**Risk of bias legend**

(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of participants and personnel (performance bias)
(D) Blinding of outcome assessment (detection bias)
(E) Incomplete outcome data (attrition bias)
(F) Selective reporting (reporting bias)
(G) Other bias

### Analysis 6.15. Comparison 6: PFMT plus electrical stimulation versus PFMT alone, Outcome 15: Adverse events relating to the viscera or anorectum (other data)

Adverse events relating to the viscera or anorectum (other data)

| Study | Intervention | Control | Assessment tool | Follow-up time | Notes |
|---|---|---|---|---|---|
| **Morihiro 2011** | "No remarkable adverse event was observed during the study period." | "No remarkable adverse event was observed during the study period." | Adverse events | NR | |

## ADDITIONAL TABLES

### Table 1. Handling of data multiplicity

| Study ID | Outcome measure | Measurement tools used | Decision |
|---|---|---|---|
| Franke 2000 | Objective cure or improvement | • Pad free rate | Mean incontinence weight per 24 hours on pad test may be more objectively measured |

**Table 1. Handling of data multiplicity** *(Continued)*

| | | | |
|---|---|---|---|
| | | • Mean incontinence weight (gm per 24 hours on pad test) | |
| Glazener 2011a and Glazener 2011b | Adherence to treatment (dichotomous) | • Number undertaking any PFMT in past week<br>• Number undertaking no PFMT in past week<br>• Number unsure if they have undertaken PFMT in past week<br>• Number undertaking PFMT every day in past week<br>• Number undertaking 5-6 days of PFMT in past week<br>• Number undertaking 3-4 days of PFMT in past week<br>• Number undertaking 1-2 days of PFMT in past week | Number undertaking PFMT every day in past week would be of most clinical relevance |
| | Objective cure or improvement | • Frequency of daytime UI from diaries<br>• Frequency of nocturnal UI from diaries | Frequency of daytime UI may better reflect cure or improvement |
| Gomes 2018 | Objective cure or improvement (continuous) | • Reduction in pad usage<br>• Improvement in 24-hour pad test | Improvement in 24-hour pad test may be more objective |
| | Objective cure or improvement (dichotomous) | • % continent, defined as no pads per day<br>• % with < 8 g on 24-hour pad test | % with < 8 g on 24-hour pad test may be more objective |
| Kakihara 2007 | Objective cure or improvement (continuous) | • 1 hour pad test<br>• Number of diapers used | Improvement in 1-hour pad test may be more objective |
| Pedriali 2016 | Objective cure or improvement | • Number of pads used per day<br>• Pad weight on 24-hpur pad test | 24-hour pad test may be more objective |
| Robinson 2009 | Objective cure or improvement | • PFM strength<br>• UI frequency<br>• UI volume | Likely not possible to standardise UI volume unless derived from pad test, but not specified. UI frequency aligns with protocol. |
| | Condition-specific quality of life | • Male Urinary Symptom Impact Questionnaire (MUSIQ)<br>• UI Distress Male Urogenital Distress Inventory (MUDI) | Cronbach's alpha for MUSIQ = 0.95, Cronbach's alpha for MUDI = 0.89 (Robinson 2002). As such, MUSIQ used |
| Strojek 2021 | Condition-specific quality of life | • EPIC-26 overall urinary difficulties<br>• EPIC-26 incontinence subscale | The incontinence subscale is more specific to the review question |
| Van Kampen 2000 | Objective cure or improvement | • Number of participants considered continent (imputed from numbers of incontinent participants on pad test - dichotomous)<br>• Urine loss on 24-hour pad test (continuous) | Due to lack of data for this comparison and outcome, can only place into 'Other data' tables. To avoid double-counting, g loss on 24-hour pad test considered to better quantify improvement |

**Table 1. Handling of data multiplicity** *(Continued)*

| | | | |
|---|---|---|---|
| Yamanishi 2010 | Subjective cure or improvement | • Total ICIQ-SF score<br>• Frequency of leakage score on ICIQ-SF<br>• Leak volume score on ICIQ-SF | Total ICIQ-SF score represents a more comprehensive summary of the level, impact and perceived cause of incontinence symptoms |
| | Objective cure or improvement (continuous) | • g leakage on 24-hou pad test<br>• % daily leakage on 24 hour pad test, expressed as a mean | G leakage on 24 24-hour pad test considered more relevant as more closely represents actual values |

**EPIC-26:** Expanded Prostate cancer Index Composite
**ICIQ-SF:** International Consultation of Incontinence Questionnaire – Short Form
**MUDI:** Male Urogenital Distress Inventory
**MUSIQ:** Male Urinary Symptom Impact Questionnaire
**PFM:** pelvic floor muscle
**PFMT**: pelvic floor muscle training
**UI: urinary** incontinence

**Table 2. Sensitivity analysis for studies where UI was not reported clearly in eligibility criteria**

| Comparison | Analysis | Original result with all studies included | Studies removed in sensitivity analysis | Sensitivity analysis result | Absolute effects for sensitivity analysis |
|---|---|---|---|---|---|
| PFMT versus no treatment, sham treatment or verbal/written instructions | 1.4 Objective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis) | RR 1.50 (95% CI 1.33 to 1.69) | Filocamo 2005 | RR 1.71 (95% CI 1.13 to 2.61) – 1 study | Control: 400 per 1000<br>PFMT: 684 per 1000 (452 to 1000) |
| | 1.6 Objective cure or improvement in UI: > 6 to 12 months (dichotomous meta-analysis) | RR 1.40 (95% CI 0.80 to 2.44) | Filocamo 2005 | RR 1.79 (95% CI 1.27 to 2.53) – 1 study | Control: 475 per 1000<br>PFMT: 850 per 1000 (603 to 1000) |
| Combinations of conservative treatments versus no treatment, sham treatment or verbal/written instructions | 5.5 Condition-specific quality of life: > 3 to 6 months (continuous meta-analysis) | SMD -0.22 (95% CI -0.44 to 0.01) | Ahmed 2012 | SMD -0.2 (95% CI -0.45 to 0.05) – 4 studies | N/A |
| | 5.8 Objective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis) | RR 1.55 (95% CI 1.20 to 2.00) | Ahmed 2012 | RR 1.83 (95% CI 1.07 to 3.12) – 2 studies | Control: 227 per 1000<br>Combinations: 416 per 1000 (243 to 709) |
| | 5.9 Objective cure or improvement in UI: > 3 to 6 months (continuous meta-analysis) | SMD -0.21 (95% CI -0.47 to 0.05) | Ahmed 2012 | SMD -0.12 (95% CI -0.35 to 0.11) – 5 studies | N/A |
| PFMT + Electrical stimulation versus PFMT alone | 6.1 Subjective cure or improvement in UI: > 3 to 6 months (dichotomous meta-analysis) | RR 1.46 (95% CI 0.96 to 2.23) | Ceresoli 2002; Morihiro 2011 | RR 2.67 (95% CI 1.15 to 6.17) – 1 study | PFMT alone: 250 per 1000<br>PFMT + electrical stimulation: 668 per 1000 (288 to 1000) |

**CI:** confidence interval; **MD:** mean difference;**RR** :risk ratio; **SMD :**standardised mean difference

**Table 3. Sensitivity analysis excluding studies at high risk of bias**

| Comparison | Analysis | Result from main analysis | Studies removed in sensitivity analysis | Sensitivity analysis result | Absolute effects for sensitivity analysis |
|---|---|---|---|---|---|
| PFMT + Electrical stimulation versus PFMT alone | 6.3 Subjective cure or improvement in UI: > 6 to 12 months (continuous meta-analysis) | SMD -0.06 (95% CI -0.56 to 0.43) | Kakihara 2007 | SMD -0.22 (95% CI -0.79 to 0.36) – 1 study | N/A |
| | 6.6 Condition-specific quality of life: > 6 to 12 months (continuous meta-analysis) | SMD 0.05 (95% CI -0.51 to 0.62) | Kakihara 2007 | SMD -0.14 (95% CI -0.71 to 0.43) – 1 study | N/A |
| | 6.8 Objective cure or improvement in UI: > 3 to 6 months (continuous meta-analysis) | MD -35.69 (95% CI -172.93 to 101.54) | Moore 1999a | MD -112.30 (95% CI -226.70 to 2.10) – 1 study | N/A |
| | 6.10 Objective cure or improvement in UI: > 6 to 12 months (continuous meta-analysis) | SMD 0.06 (95% CI -0.94 to 1.07) | Kakihara 2007 | SMD -0.38 (95% CI -0.96 to 0.20) – 1 study | N/A |
| | 6.14 Adverse events relating to the viscera or anorectum (dichotomous meta-analysis) | RR 1.04 (95% CI 0.04 to 29.33) | Moore 1999a | RR 5.74 (95% CI 0.29 to 114.41) – 1 study | PFMT alone: 0 per 1000<br>PFMT + electrical stimulation: 0 per 1000 |

**CI :** confidence interval;**MD :** mean difference; **RR:** risk ratio; **SMD**: standardised mean difference; **UI:** urinary incontinence

## APPENDICES

### Appendix 1. Glossary of terms

| | |
|---|---|
| **532 nm ('Greenlight') laser vaporisation of the prostate** | An operation performed through the urethra (the channel allowing urine from the urinary bladder to leave the body) for men who have problems passing urine because of a benign (non-cancerous) enlargement of the prostate gland that surrounds the urethra. It utilises a specific type of laser absorbed by blood cells (Greenlight) to enlarge the urinary channel by melting away (vaporising) excess prostate tissue that is blocking the urethra and preventing urine flow. |
| **Benign prostatic obstruction (BPO)** | Blocking of the bladder outlet for urine flow due to non-cancerous enlargement of the prostate gland. |
| **Bipolar transurethral enucleation of the prostate (B-TUEP)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises electrical energy delivered through an electrical circuit completed at the operation site (bipolar circuitry) to enlarge the urinary channel. It does this by removing as a whole (enucleating) the central part of the prostate tissue that is blocking the urethra (the adenoma, or benign tumour) to the urinary bladder. Another instrument (a morcellator) is then used to cut the adenoma into small pieces in the urinary bladder. The small pieces are then easily removed from the urinary bladder. |

*(Continued)*

| | |
|---|---|
| **Bipolar transurethral vaporisation of the prostate (B-TUVP)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises electrical energy delivered through an electrical circuit completed at the operation site (bipolar circuitry) to enlarge the urinary channel by melting away (vaporising) excess prostate tissue that is blocking the urethra and preventing urine flow. |
| **Bipolar TURP (B-TURP)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises electrical energy delivered through an electrical circuit completed at the operation site (bipolar circuitry) to enlarge the urinary channel by cutting into small pieces (resecting) excess prostate tissue that is blocking the urethra and preventing urine flow. The small pieces are then easily removed from the urinary bladder. |
| **Biofeedback** | A form of feedback using an external sensor that can be combined with pelvic floor muscle training as a way of enhancing the therapy. |
| **Detrusor** | A muscle found in the wall of the urinary bladder. |
| **Detrusor overactivity (DO)** | Involuntary sudden spasms of the muscle that surrounds the urinary bladder (detrusor) resulting in a sudden urge to urinate that may be followed by an involuntary loss of urine. |
| **Diode laser enucleation of the prostate (DiLEP)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises a specific type of laser absorbed by water (diode laser) to enlarge the urinary channel by removing as a whole (enucleating) the central part of the prostate tissue that is blocking the urethra (adenoma) to the urinary bladder. Another instrument (a morcellator) is then used to cut the adenoma into small pieces in the urinary bladder that are easily removed. |
| **Electrical therapy** | The use of electrical potential or electrical currents to encourage therapeutic responses. |
| **Holmium laser enucleation of the prostate (HoLEP)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises a specific type of laser absorbed by water (holmium laser) to enlarge the urinary channel by removing as a whole (enucleating) the central part of the prostate tissue that is blocking the urethra (adenoma) to the urinary bladder. Another instrument (a morcellator) is then used to cut the adenoma into small pieces in the urinary bladder that are easily removed. |
| **Intracavitary electrical stimulation** | Delivery of electrical stimuli through the anus. |
| **Magnetic stimulation**: | The use of a magnetic field to encourage therapeutic responses. |
| **Micturition** | Micturition, or urination, is the act of passing urine from the body |
| **Mixed urinary incontinence (MUI)** | Incontinence that occurs when a person has symptoms of both stress urinary incontinence and urgency urinary incontinence. |
| **Monopolar transurethral resection of the prostate (M-TURP)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises electrical energy delivered through an electrical circuit that travels through the body to reach a skin pad (monopolar circuitry) to enlarge the urinary channel by cutting into small pieces (resecting) excess prostate tissue that is blocking the urethra and preventing urine flow. The small pieces are then easily removed from the urinary bladder. |
| **Open prostatectomy (OP)** | An operation performed through an incision (cutting) of the body for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. The index finger of the surgeon is used to enlarge the urinary channel by removing as a whole (enucleate) the central part of the prostate tissue (the adenoma, or benign tumour) that is blocking the urethra. |

(Continued)

| | |
|---|---|
| **Pelvic floor muscle training (PFMT)** | Training and exercises that include a correct contraction of the pelvic floor muscles into daily activities (e.g. lifting, getting out of bed). |
| **Prostate enucleation methods** | Methods that remove as a whole (enucleate) the central part of the prostate tissue that is blocking the urethra (adenoma). |
| **Prostatic urethral lift (PUL)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises small permanent suture-based implants to enlarge the urinary channel by pushing aside (encroaching) the excess prostate tissue that is blocking the urethra and preventing urine flow. |
| **Radical prostatectomy (RP) surgery** | An operation for men with prostate cancer that aims to remove the entire prostate gland. |
| **Refractory SUI** | Stress urinary incontinence that does not resolve or improve on its own. |
| **Stress urinary incontinence (SUI)** | Incontinence that is caused by physical exertion (e.g. sneezing or coughing). |
| **Thulium laser vaporesection of the prostate treatment (ThuVAPR)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises a specific type of laser absorbed by water (thulium laser) to enlarge the urinary channel by simultaneously cutting into small pieces (resecting) and melting away (vaporising) excess prostate tissue that is blocking the urethra and preventing urine flow. The small pieces are then easily removed from the urinary bladder. |
| **Thulium laser enucleation of the prostate (ThuLEP)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises a specific type of laser absorbed by water (thulium laser) to enlarge the urinary channel by removing as a whole (enucleating) the central part of the prostate tissue that is blocking the urethra (adenoma) to the urinary bladder. Another instrument (a morcellator) is then used to cut the adenoma into small pieces in the urinary bladder that are easily removed. |
| **Transcutaneous electrical stimulation** | Delivery of electrical stimuli through the skin using patches. |
| **Transient urinary incontinence (UI)** | Urinary incontinence that resolves or improves on its own. |
| **Transurethral incision of the prostate (TUIP)** | An operation performed through the urethra for men who have problems passing urine because of non-cancerous enlargement of the prostate gland. It utilises electrical energy to open the bladder outlet by cutting (incising) it without prostatic tissue removal. |
| **Urgency urinary incontinence (UUI)** | Incontinence where a sudden urge to urinate is followed by an involuntary loss of urine. |
| **Urodynamics** | Procedures that look at how well the bladder, sphincters and urethra are storing and releasing urine. Most urodynamic tests focus on the bladder's ability to hold urine and empty steadily and completely. Urodynamic tests can also show whether the bladder is having involuntary contractions that cause urine leakage. |

## Appendix 2. Search for clinical effectiveness studies

We searched the Cochrane Incontinence Specialised Register using the following terms:

topic.urine.incon.postprost*
AND
(design.cct* OR design.rct*)

All searches were of the keywords field of EndNote 2018.

## HISTORY

Protocol first published: Issue 5, 2021

## CONTRIBUTIONS OF AUTHORS

EEJ: study selection, data extraction, data analysis, GRADE assessments, report writing
CM: assisted with report writing, arbitration of decisions at study selection and data extraction stages, provided clinical support
AS: assisted with study selection, data extraction and GRADE assessments
MIO: assisted with report writing, arbitration of decisions at study selection and data extraction stages, provided clinical support
SS: study selection, data extraction, assisted with report writing

## DECLARATIONS OF INTEREST

In accordance with Cochrane's Commercial Sponsorship Policy, the following declarations are relevant from 36 months before the title was registered.

EEJ: Is currently Assistant Managing Editor for Cochrane Incontinence. However, she did not take part in any aspect of the editorial process for this review.
CM: none.
AS: none.
MIO: is an Editor for Cochrane Urology. However, he did not take part in any aspect of the editorial process for this review.
SS: none.

## SOURCES OF SUPPORT

### Internal sources

- No sources of support provided

### External sources

- National Institute for Health Research, UK

  This project was supported by the National Institute for Health Research, via Cochrane Infrastructure funding to Cochrane Incontinence. The views and opinions expressed therein are those of the authors and do not necessarily reflect those of the Evidence Synthesis Programme, the NIHR, NHS or the Department of Health and Social Care.

## DIFFERENCES BETWEEN PROTOCOL AND REVIEW

### Types of participants

Since the protocol, we have clarified the inclusion and exclusion criteria surrounding the timing of randomisation for participants as follows.

- We decided that we would exclude any study where participants were randomised to an intervention prior to receiving prostate surgery. This is because it is now less likely that men undergoing prostate surgery will have post-prostatectomy urinary incontinence (UI), but also because we could not be sure that the participants included would have UI after surgery.
- We excluded any paper where participants had been randomised prior to catheter removal post-surgery. This is for the same reason as above.

As these changes from protocol were decided at full-text screening stage for the initial search, EJ and SS performed a check of 10% of records originally deemed irrelevant at title and abstract stage to check against the revised inclusion criteria. No further relevant records were identified, and so we commenced full-text screening with the updated eligibility criteria.

We included papers where the population of interest appeared to be men with post-prostatectomy UI but where this was not specified as part of the inclusion criteria. In order to assess the influence of these studies, we performed additional sensitivity analyses, which were not originally planned at the protocol stage.

### Types of interventions

We modified the comparisons of interest for the review as follows.

- We merged the comparisons of ' pelvic floor muscle training (PFMT) versus no treatment or sham treatment' and 'PFMT versus verbal and written instructions' into a single comparison and added 'verbal and written instructions' As there is a potential that men receiving verbal or written instruction as opposed to no or sham treatment would be able to undertake some form of treatment, we used 'Notes' in meta-analyses, where possible, to highlight different trial comparators.
- We clarified that biofeedback was only considered as an intervention when it was undertaken on an ongoing basis. It was not considered an intervention if it was delivered once as part of a PFMT training session, as this should be standard clinical practice.
- We changed the final comparator from 'One conservative treatment versus another conservative treatment' to 'PFMT plus electrical stimulation versus PFMT alone'. The original comparator had the potential to result in a large amount of clinical and statistical heterogeneity once analysed, potentially limiting the applicability and robustness of eventual results. We therefore streamlined the comparator to what we believed was of the most importance to clinicians and patients.

**Types of outcome measures**

- We amended the wording of the three outcomes related to adverse events to ensure that there was greater clarity in what the three categories would encompass.
- We clarified that one of the time points for the review is ≥ three to six months.

**Data synthesis**

- We changed the approach to fixed-effect and random-effects in the review, so that all analyses operated on random-effects. This was in response to peer review comments.
- We clarified our methods for handling data multiplicity across studies with the analyses.
- We clarified that we used the Synthesis Without Meta-analysis approach to narrative synthesis where meta-analysis was not possible

**Brief economic commentary**

- We originally planned to incorporate a brief economic commentary (BEC) into the review, but this was not possible due to pragmatic time constraints. Future updates of this review may add a BEC to give an overview of the economic evidence.

## NOTES

To aid clarity, the previous Cochrane Review on this topic has been split into prevention and management (this review) of this condition (Anderson 2015).