

Pelvic floor exercises after radical prostatectomy

Grace Dorey

Abstract

Prostate cancer is the most common cancer in men in the UK. Treatment with radical prostatectomy may produce risk factors that commonly include urinary incontinence and erectile dysfunction. Post-prostatectomy incontinence can be classified as either stress urinary incontinence, urge urinary incontinence or post-micturition dribble. Evidence has shown that these embarrassing conditions may be treated successfully with pre-operative and post-operative pelvic floor exercises, which include 'the knack', urge suppression, fluid advice and a post-void contraction for post-micturition dribble. New evidence suggests that men with erectile dysfunction may benefit from the same pelvic floor exercises.

Key words: Pelvic floor exercises ■ Urinary incontinence ■ Erectile dysfunction ■ Prostate cancer

Prostate cancer is the most common cancer in men in the UK, with more than 41 000 new cases and 9000 deaths from the disease each year (Cancer Research UK, 2012). Radical prostatectomy is increasingly becoming the preferred treatment for localised prostate cancer now that nerve-sparing techniques can help to preserve potency and continence. The whole prostate gland is removed through a suprapubic incision (open prostatectomy), laparoscopic or robot-assisted surgery and the formation of an anastomosis between the urethra and the bladder. The risk factors after radical prostatectomy include urinary incontinence and erectile dysfunction.

In a large trial of 533 men conducted by Glazener et al (2011), it was found that after radical prostatectomy 89% suffered from urinary incontinence 6 weeks after surgery. Of these, 86% of the group randomised to receive four sessions of pelvic floor exercises and 89% of the controls still suffered urinary leakage 3 months later.

Post-prostatectomy incontinence should be treated according to the presenting symptoms. Following radical prostatectomy, patients may have stress urinary incontinence due to bladder neck sphincter damage, or urge urinary incontinence, or a combination of both types. They may have post-micturition dribble but they may have also experienced this before surgery.

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The internal urethral sphincter at the bladder neck is damaged in all forms of prostatectomy and continence relies on a competent external urethral sphincter, reinforced by the pelvic floor musculature. The external urethral sphincter may be weakened from disuse during the period when the urethra was compressed by an enlarged prostate.

Symptoms of frequency, nocturia, urgency, urge urinary incontinence, stress urinary incontinence and post-micturition dribble can be treated conservatively with pelvic floor muscle exercises, urge suppression techniques and lifestyle changes.

Treatment follows a full subjective assessment, which includes a full surgical and medical history. The objective assessment includes a digital anal examination in which the strength and endurance and speed of recruitment of the anal sphincter and the puborectalis muscle is assessed and recorded. These muscles are graded 0-6 for muscle strength using a modified Oxford scale for the duration of the hold in seconds and for the ability to perform a fast contraction (Table 1).

Most men appreciate an explanation of their medical condition with the help of diagrams and models and the treatment options available. They may benefit from reading the booklet *Living and Loving after Prostate Surgery* before the prostatectomy (Dorey, 2005). Information leaflets from Prostate Cancer UK are also useful and are available from www.prostatecancer.org (Figure 1, Figure 2 and Figure 3).

Pre-operative pelvic floor exercises

Two randomised controlled trials have supported the use of pre-prostatectomy pelvic floor muscle exercises at a time when patients are fit and able to cope with learning a new skill (Porru et al, 2001; Sueppel et al, 2001). There is also likely to be benefit from an early patient/therapist relationship, which helps to empower the patient.

Table 1. Assessment of male pelvic floor muscle strength

Description	Grade
Nil	0 No muscle contraction
Flicker	1 Muscle flickers
Weak	2 Weak contraction with no movement
Moderate	3 Moderate contraction with movement
Good	4 Good contraction against resistance
Strong	5 Strong contraction against strong resistance
Very strong	6 Very strong squeeze gripping finger tightly

Post-operative exercises for urinary incontinence

Pelvic floor muscle exercises seem to have merit as a treatment for post-prostatectomy incontinence. Three randomised controlled trials demonstrated a significant reduction in levels of incontinence between the group receiving pelvic floor muscle training and the control group. This evidence showed that early return to urinary continence was seen in some men who performed pelvic floor exercises before and after radical prostatectomy (Parekh et al, 2003) and post radical prostatectomy (Filocamo et al, 2005; Van Kampen et al, 2000).

However, a large randomised controlled trial undertaken by Glazener et al (2011) found no benefit from pelvic floor exercises after radical prostatectomy; men received only four treatments (some less) led by nurses and physiotherapists (many of whom were not specialists in male incontinence) and the control group received standard care, which in some hospitals consisted of a leaflet with instructions on pelvic floor exercises. At 1 year, 50% of the radical prostatectomy control group were performing pelvic floor exercises. This may have been more successful if the men had undergone a weekly treatment led by a skilled therapist until they were dry as in the trial by Van Kampen et al (2000).

Post-operative exercises for erectile dysfunction

Post-prostatectomy pelvic floor exercises appear to have merit for men with erectile function. In a randomised controlled trial undertaken by Prota et al (2012), 26 men who had undergone a radical prostatectomy undertook pelvic floor exercises and electromyographic biofeedback in the clinic once a week for 3 months, while 26 men in the control group received only verbal instructions to contract the pelvic floor. Erectile dysfunction was evaluated using the International Index of Erectile Function-5 (IIEF-5) before surgery and 1, 3, 6 and 12 months post-surgery. In the treatment group, eight patients (47.1%) recovered potency at 12 months post-operatively compared to two (12.5%) in the control group ($p=0.032$). A strong association was observed between the recovery of potency and urinary continence, with continent patients having a 5.4 x greater chance of being potent ($p=0.04$).

Dorey et al (2004a) excluded men who had undergone a radical prostatectomy from their randomised controlled trial, which found that pelvic floor exercises were significantly effective for men with erectile dysfunction. In a large randomised controlled trial, Glazener et al (2011) found pelvic floor exercises were not effective for men with erectile dysfunction after radical prostatectomy, but this may have been because men received four treatments or less and because many in the control group were performing pelvic floor exercises. Also the trial was not designed to show whether the men who were potent before surgery improved post-operatively.

Sighinolfi et al (2009) reported in a case study that three patients post radical prostatectomy improved urinary incontinence and erectile function with an IIEF-15 score rising from 17 to 22.

Men may have difficulty gaining or maintaining an erection due to nerve damage from the effects of surgery or post-operative swelling leading to nerve compression. Damaged nerves can regrow and healing continues for up to 1 year after prostatectomy. More effective healing takes place

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After 12 weeks of treatment:

- + 74% reduction in average involuntary urine loss over a 24 hour period.
- + 86% of subjects were defined as having 'dry' or 'mild' severity of symptoms.

(Based on change in pad weight during 24-hour pad rest; 'mild' defined as <12g but >10g of urine leaked)

Assessment Time (Hours)	Urine Leakage (g)
0	30
4	25
8	20
12	15
16	10
20	8
24	6
28	5

if there is a good blood supply. Pelvic floor muscle exercises help to bring more oxygenated blood to the area and help to remove de-oxygenated blood. One of the first signs that erectile function is improving is when men wake up with an erection. Pelvic floor exercises need to be practised daily for up to 3 months in men with erectile dysfunction.

For those patients who appear to have been cured or whose symptoms have improved with the use of pelvic floor muscle training, it may be prudent to continue these simple exercises for life and possibly avoid a return of urinary incontinence and erectile dysfunction.

Pelvic floor muscle exercises

Men should practice pelvic floor muscle exercises as soon as they know that they may need prostate surgery (Box 1). Immediately after surgery, pelvic floor exercises may be performed gently while the catheter is in place provided the surgeon agrees. When the catheter has been removed, stronger pelvic floor muscle exercises may be performed. Pelvic floor exercises should be individually taught to make sure the patient is lifting up the pelvic floor and not bearing down as if defaecating (i.e. performing a valsalva manoeuvre). Men can be encouraged to tighten and lift the pelvic floor muscles as in the control of flatus and the prevention of urine flow and can practise in front of a mirror to observe a visible retraction of the base of the penis into the body and a testicular lift. The testicular lift may be sluggish initially.

The best positions in which to practise pelvic floor muscle exercises are lying on the back with knees bent and apart;

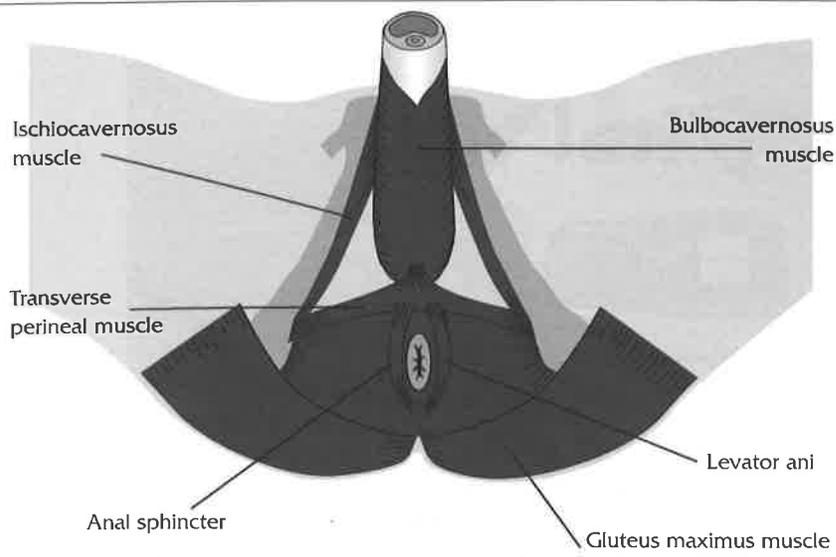


Figure 1. Superficial pelvic floor muscles in men

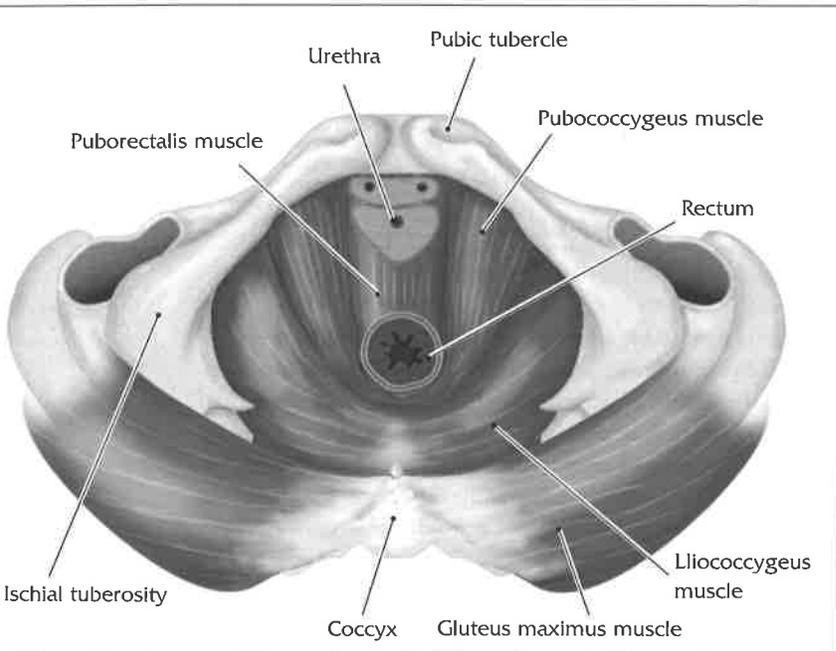


Figure 2. Deep pelvic floor muscles in men from below

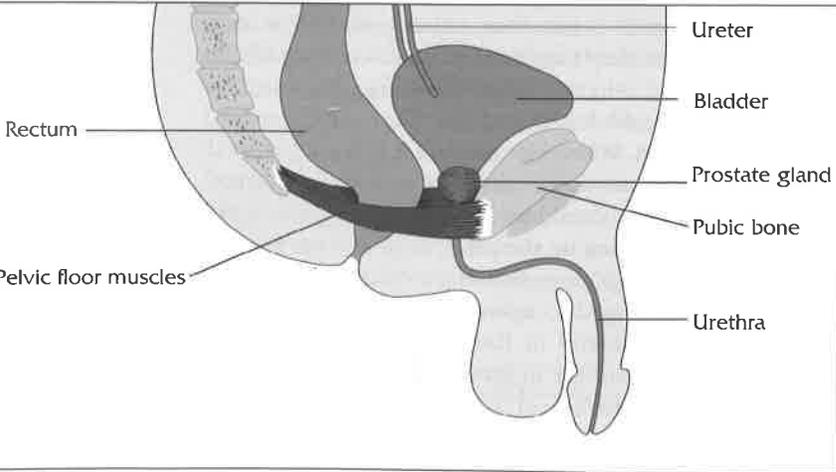


Figure 3. Deep pelvic floor muscles in men

standing with feet apart; and sitting with knees apart. The intensity of the contraction is more important than the frequency as maximum voluntary effort leads to muscle hypertrophy and increased muscle strength (Dinubile, 1991). In order to achieve full fitness, pelvic floor muscle training should include exercises for endurance as well as for muscle strength by submaximal contractions. Muscle training, therefore, depends on the motivation of the patient and the adherence to the pelvic floor exercise regime (Jackson et al, 1996). Treatment progression is patient specific and dependent on ongoing assessment.

There has been no research conducted to give a clear indication of the number of pelvic floor muscle exercises needed to build up muscle bulk, strength and endurance. For muscle building, it is the quality not the quantity that is important. Home exercises can be practised as strongly as possible twice a day supine lying, sitting and standing. The hold time in seconds is set individually by the therapist according to the number of seconds held during the digital anal examination. The rest time should exceed the hold time to allow the muscle to recover from exertion.

Exercises for stress urinary incontinence

After prostatectomy, men frequently report that they do not leak urine during sitting and lying but only on changing position, especially rising from sitting and bending forwards. Both these activities increase intra-abdominal pressure. Men can be taught to rise from sitting without bending forwards and while tightening their pelvic floor muscles. 'The knack' of tightening at times of increased intra-abdominal pressure should be taught to cope with activities such as moving from sitting to standing, coughing, sneezing and lifting (Ashton-Miller et al, 1996). Training is moving towards more functional exercises with emphasis on the voluntary use of the muscles at times when they would normally contract by reflex activity. Regular voluntary use during certain activities may become an automatic action.

Men can be taught to lift their pelvic floor slightly while walking. This will achieve a supportive lift that can become part of good posture.

Pelvic floor muscle exercises are designed to train the muscles that are important for continence, support, tissue health and sexual activity.

Exercises for urge urinary incontinence

Pelvic floor muscle exercises can be used for urge urinary incontinence to strengthen the pelvic floor musculature and regain the ability to control the urge to void urine. It is believed that pelvic floor muscle training leads to increased muscle tone that guards against unwanted detrusor contractions, although there have been no trials to support this theory.

The filling symptoms of frequency, nocturia, urgency and urge urinary incontinence can be treated with pelvic floor muscle exercises, urge suppression techniques (Box 2) and lifestyle changes, including avoiding constipation and fluid intake advice.

Men should be advised to drink if thirsty, aiming for a fluid intake of about 1.5 litres per day including fluid from liquid foods. More fluid is necessary when exercising, after eating salty foods and in a hot climate. Water is the best thirst quencher. Alcohol and caffeine can make the bladder more

Box 1. Pelvic floor exercises for men (Dorey, 2006)
In lying position
Lie on your back with your knees bent and your feet and knees slightly apart. Tighten your pelvic floor as if you are trying to stop wind escaping and urine leaking. You should feel the base of your penis move towards your body and your testicles rise. Hold the pelvic floor muscle contraction as strongly as you can. Try to avoid holding your breath or tensing your buttocks. <i>Perform a maximum of three contractions while lying down in the morning holding for up to 10 seconds, each followed by a 10 second rest. Repeat in the afternoon.</i>
In sitting position
Sit on a chair with your knees slightly apart and tighten your pelvic floor muscles as if you were trying to stop wind escaping and urine leaking. You should feel the base of your penis move towards your body and your testicles rise. Hold the pelvic floor muscle contraction as strongly as you can. Try to avoid holding your breath or tensing your buttocks. <i>Perform a maximum of three contractions sitting down in the morning holding for up to 10 seconds, each followed by a 10 second rest. Repeat in the afternoon.</i>
In standing position
Stand with your feet apart and tighten your pelvic floor muscles. If you look in a mirror you should be able to see the base of your penis move nearer to your body and your testicles gradually rise. Hold the pelvic floor muscle contraction as strongly as you can. Try to avoid holding your breath or tensing your buttocks. <i>Perform a maximum of three contractions standing up in the morning holding for up to 10 seconds, each followed by a 10 second rest. Repeat in the afternoon.</i>
Fast contractions
Some of these pelvic floor muscle contractions can start quickly with a fast contraction and some can begin slowly with a slow build up of strength.
While walking
Try lifting your pelvic floor up slightly when walking in order to use the muscles during activity. This should become a habit.
After urinating
After you have urinated while standing, try tightening your pelvic floor muscles up strongly to eliminate the urine left in the u-shaped portion of the urethra and avoid the embarrassing after-dribble of urine.
After passing a motion
After passing a motion tighten your anal sphincter before wiping your bottom. This helps to return any faeces not voided back up the anal canal to the rectum and makes it easier to wipe your bottom.
'The knack'
Tighten your pelvic floor muscles quickly just before and during any activities that increase your abdominal pressure, such as coughing, sneezing, lifting, shouting, bending and getting out of a chair.

irritable. Headaches and other unpleasant symptoms may occur if caffeine intake is not reduced gradually over a 3-week period.

Severe urge incontinence may be treated with anti-cholinergic medication. Side-effects of this medication may include a dry mouth, drowsiness, blurred vision and constipation.

Smoking increases detrusor overactivity and is linked to urge incontinence (Haidinger et al, 2000). People who smoke may be helped to quit by joining a smoking cessation programme, which are run at most general practices.

Exercises for post-micturition dribble

Post-micturition dribble is not solely a condition seen in patients post-prostatectomy but is common in men of all ages. It is common for men to experience leakage of a few

Box 2. Urge suppression techniques
Keep calm
Stand still or sit down
Relax the abdominal muscles
Wait for 1 minute until the urge disappears
When the urge has disappeared visit the toilet or continue previous activities
NEVER RUSH TO THE TOILET MID-URGE

drops of urine after urination when walking away from the toilet. It has been shown in recent research that tightening the pelvic floor muscles up strongly after voiding while standing poised over the toilet expels the last few drops from the bulbar u-shaped portion of the urethra and eliminates post-micturition dribble (Dorey et al, 2004b). This strong post-void pelvic floor muscle contraction supersedes the technique of milking the urine from the bulbar urethra with bulbar urethral massage.

Post-prostatectomy complications

Various complications may arise after prostatectomy and can be treated by different members of the healthcare team.

Incontinence pads

Incontinence pads can be held in place with tight fitting pants and are preferable to a penile sheath and leg-bag urine-collection system. Men should be encouraged to attempt to pass urine regularly and not rely on a pad or drainage system. It is important to encourage the bladder storage phase of micturition. Men should be encouraged to tighten their pelvic floor muscles when they have a sensation of leakage of urine or at times when leakage may occur.

Persisting incontinence

Patients with long-term post-prostatectomy incontinence may still benefit from using pelvic floor muscle exercises a year after surgery. Men need to know when to tighten their pelvic floor muscles to avoid urinary leakage. Urge suppression techniques may also help.

There are a number of surgical options to help men with severe incontinence that has not responded to conservative treatment and that persists for more than 1 year after radical prostatectomy. The new ProACT device can be implanted during minimally invasive surgery or the male sling procedure for men with persisting incontinence. These are alternatives to the more major artificial urethral sphincter.

Urethral stricture

After a radical prostatectomy, a urethral stricture may form during the healing process at the anastomosis between the bladder and the urethra. This stricture may cause obstruction to the flow of urine. Treatment consists of stretching the urethra under anaesthetic using balloon dilatation or surgical resection with a urethrotomy. Maintenance treatment consists of passing a lubricated catheter along the urethra at regular intervals.

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Conclusion

Post prostatectomy stress urinary incontinence may be treated with pelvic floor muscle exercises, which should include tightening the pelvic floor muscles during times of increased intra-abdominal pressure. The filling symptoms of frequency, nocturia, urgency and urge urinary incontinence can be treated with pelvic floor muscle exercises, urge suppression techniques and lifestyle changes, including avoiding constipation and fluid intake advice. The same pelvic floor muscle exercises should be the first-line treatment for men with erectile dysfunction. **BJN**

Conflict of interest: none

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KEY POINTS

- Prostate cancer is the most common cancer in the UK
- Radical prostatectomy is performed for prostate cancer
- Prostatectomy commonly causes urinary incontinence and erectile dysfunction
- Pelvic floor exercises are effective for urinary incontinence and erectile dysfunction
- Urge suppression techniques are useful for men with urge urinary incontinence
- A post-void contraction can eliminate post-micturition dribble

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