BJUI
BJU International

# A multicomponent theory-based intervention improves uptake of pelvic floor muscle training before radical prostatectomy: a 'before and after' cohort study

Andrew D. Hirschhorn*†, Gregory S. Kolt* and Andrew J. Brooks‡

*School of Science and Health, University of Western Sydney, Penrith, †Westmead Private Physiotherapy Services, and ‡Western Urology, Sydney, NSW, Australia

G.S.K. and A.J.B. contributed equally to this work

## Objective

- To assess the effect of a multicomponent theory-based intervention, incorporating patient information guides, an evidence summary, audit and feedback processes and a provider directory, in the provision/receipt of preoperative pelvic floor muscle training (PFMT) among patients undergoing radical prostatectomy.

## Subjects and Methods

- Over an 18-month period (9 months before and 9 months after the intervention), we measured the provision/receipt of preoperative PFMT using surveys of patients undergoing radical prostatectomy at one public hospital ($n = 32$) and two private hospitals ($n = 107$) in Western Sydney, Australia, as well as practice audits of associated public sector ($n = 4$) and private sector ($n = 2$) providers of PFMT.
- Self-report urinary incontinence was assessed 3 months after radical prostatectomy using the International Consultation on Incontinence Questionnaire – Urinary Incontinence Form (ICIQ-UI Short Form).

## Results

- There was a significant increase in the proportion of survey respondents receiving preoperative PFMT post-intervention (post-intervention: 42/58 respondents, 72% vs pre-intervention: 37/81 respondents, 46%, $P = 0.002$).
- There was a corresponding significant increase in provision of preoperative PFMT by private sector providers (mean [SD] post-intervention: 16.7 [3.7] patients/month vs pre-intervention: 12.1 [3.6] patients/month, $P = 0.018$).
- Respondents receiving preoperative PFMT had significantly better self-report urinary incontinence at 3 months after radical prostatectomy than those who did not receive preoperative PFMT (mean [SD] ICIQ-UI Short Form sum-scores: 6.2 [5.0] vs 9.2 [5.8], $P = 0.002$).

## Conclusions

- The intervention increased the provision/receipt of preoperative PFMT among patients undergoing radical prostatectomy.
- Additional component strategies aimed at increasing the use of public sector providers may be necessary to further improve PFMT receipt among patients undergoing radical prostatectomy in the public hospital system.

## Keywords

prostatectomy, urinary incontinence, pelvic floor muscle training, translational research

## Introduction

Urinary incontinence remains a common and clinically important complication of radical prostatectomy, notwithstanding advances in surgical techniques [1,2]. The usual time course of post-prostatectomy urinary incontinence (PPUI) is one of progressive improvement [1], with continence rates of 70–100% 12 months after surgery [3,4]. As such, surgical interventions for PPUI are generally only considered for those patients with persistent and stabilized PPUI, 6–12 months after surgery [5]. Up to 72% of patients, however, report 'early' (3 months after surgery) and severe urine leakage and/or related bother [6]. Even if non-persistent, this early PPUI reduces health-related quality of life (HR-QoL) [7], and may delay return to work and/or usual physical and social activity [8]. Consequently, the

 | doi:10.1111/bju.12385 *BJU Int* 2014; **113:** 383–392

potential for conservative therapies to reduce the severity and duration of early PPUI has been the subject of considerable research. A Cochrane review of the conservative management of PPUI, for example, lists 33 randomized controlled trials of peri-operative therapies, including pelvic floor muscle training (PFMT) [9]. The authors of the review concluded that PFMT reduced PPUI, but cautioned that trials were of poor to moderate quality, and that there was variation in the timing, type and intensity of PFMT in the reviewed studies.

Notably, of five randomized trials investigating the efficacy of prophylactic preoperative PFMT vs no PFMT or 'verbal instruction only' controls, including one published after the Cochrane review, four (combined cohort $n = 313$) showed statistically and clinically significant benefits of PFMT [10–13]. Benefits included a reduced median time to urinary continence, improved continence rates 1–6 months after surgery, and improved self-report continence/related bother. Accordingly, prophylactic PFMT is now recommended for all patients undergoing radical prostatectomy [14]. European guidelines for the management of PPUI include PFMT as a first-line conservative strategy [5]. Australasian expert opinion concurs, further recommending that, wherever possible, PFMT be taught preoperatively by a physiotherapist or continence nurse [15].

Notwithstanding the primary research evidence and published recommendations, globally the provision/receipt of preoperative PFMT to/by patients undergoing radical prostatectomy is probably suboptimum. In an editorial comment on a trial supporting preoperative PFMT, Goode [14] noted that 'the translation from research to practice [of PFMT] has not been optimum', and 'most men undergoing radical prostatectomy do not receive PFMT'. It is also noteworthy that 'standard' care, as described by those facilities conducting research on PFMT, typically involves either no PFMT or postoperative verbal/written instruction only [6,10–13].

Qualitative research, conducted by the study authors (unpublished work), found that there were multiple local barriers to the routine provision of preoperative PFMT. These barriers included: limited patient awareness of the role of preoperative PFMT; limited referrer and patient awareness of PFMT providers; and referrer concerns regarding the strength of evidence supporting PFMT.

In the current study, we investigated the effect of a multicomponent, theory-based intervention, informed by our qualitative research, on the provision and receipt of preoperative PFMT by patients undergoing radical prostatectomy. As a secondary aim, we sought to compare postoperative outcomes (PPUI, satisfaction with treatment, HR-QoL) of patients receiving preoperative PFMT with those not receiving it.

## Subjects and Methods

The study was undertaken within one urological cancer centre in Western Sydney, Australia. Ethical approval was obtained from the Western Sydney Local Health District and University of Western Sydney Human Research Ethics Committees.

### Subjects

Between July 2011 and December 2012, patients undergoing radical prostatectomy at one public hospital (Public 1) and one co-located private hospital (Private 1) were invited by third parties to the research team (i.e. hospital clinicians) to receive a survey from the researchers. Exclusion criteria included a non-English-speaking background and a perceived inability to provide informed consent.

A new, robot-assisted radical prostatectomy service was established at a second private hospital in Western Sydney (Private 2) in August 2011, resulting in a partial transfer of the surgical caseload from Public 1 and Private 1. Private 2 was therefore added as a study site from January 2012 to December 2012.

### Survey

Those patients consenting to have their contact details provided to the researchers were mailed an anonymous survey 3 months after surgery. This survey included: (i) demographic questions, including age, postal code, hospital of surgery, and health insurance status; (ii) questions relating to the receipt of PFMT, both before and after surgery; (iii) questions relating to satisfaction with treatment received for urinary incontinence; (iv) The International Consultation on Incontinence Questionnaire – Urinary Incontinence Form (ICIQ-UI Short Form) [16]; and (v) The RAND 36-item Short Form Health Survey 1.0 (SF-36) [17].

#### Demographic questions

Although Australia has universal, publicly funded healthcare [18], individuals may also purchase private health insurance that provides a choice of surgeon, facilitates private hospital admission, and may provide financial assistance for private sector allied health services ('extras cover'), e.g. PFMT. We have found differing barriers to preoperative PFMT in private vs public hospital patients (unpublished work), and others have reported differences in prostate cancer care, control and survival in patients with/without private health insurance in Australia and Europe [18,19]. For this reason, questions pertaining to hospital of surgery and health insurance status were included in the survey.

#### Receipt of PFMT

Respondents were deemed to have received preoperative PFMT if they indicated that: (i) they had received education and/or training in the performance of pelvic floor muscle

exercises preoperatively; (ii) the training was provided by a physiotherapist and/or nurse (not the urologist); and (iii) the education/training included 'one-to-one physical training'. Respondents reporting that their education/training consisted of any combination of verbal instruction, printed reading material, material from the internet or DVD/video, but without 'one-to-one physical training', were deemed to have not received preoperative PFMT.

Respondents were similarly deemed to have received 'postoperative PFMT alone' if they indicated that, in the absence of preoperative PFMT: (i) they had received education and/or training in the performance of pelvic floor muscle exercises after leaving hospital; (ii) that the training was provided by a physiotherapist and/or nurse; and (iii) that the education/training included 'one-to-one physical training'.

### Satisfaction with treatment

The survey contained three items, relating to satisfaction with: (i) the choices respondents had for treatment (for leakage of urine); (ii) the treatment received (if applicable); and (iii) the effect of treatment. For each item, respondents were asked to select one of five responses. For the purpose of analysis, responses were transformed to dichotomous data ('very dissatisfied', 'dissatisfied' or 'neither satisfied nor dissatisfied' = not satisfied; 'satisfied' or 'very satisfied' = satisfied).

### Included questionnaires

The choice of included PPUI and HR-QoL questionnaires (ICIQ-UI Short Form and SF-36) was based on established validity [16], previous use in trials of preoperative PFMT [10,11,13], brevity (to reduce respondent burden), and ability to compare outcomes with population norms [20].

## Practice Audits

To corroborate survey data on receipt of preoperative PFMT, we conducted audits of all local public sector services identified as providing PFMT, including continence/pelvic floor clinics ($n = 3$) and physiotherapy departments ($n = 1$), and private sector physiotherapy practices identified as having established clinical relationships with local urologists ($n = 2$). Practices were asked to provide month-by-month data on: (i) the number of patients provided with preoperative PFMT (initial consultations only); and (ii) the number of patients provided with postoperative PFMT, not having been seen preoperatively. Only patients having radical prostatectomy at Public 1, Private 1 or Private 2 were included in practice audits.

## Intervention

The intervention was informed by an analysis of barriers and enablers to preoperative PFMT conducted within the local clinical setting. The Theoretical Domains Framework was used in the analysis of barriers/enablers [21], and a systematic approach, similar to that described by French et al. [22], was used to direct the choice of intervention components. A committee of local stakeholders then provided consultation on the feasibility, local relevance and acceptability of the components.

The four primary intervention components were: (i) patient information guides; (ii) an evidence summary; (iii) audit and feedback newsletters and presentations; and (iv) a provider directory.

### Patient information guides

We developed a patient information guide, to be distributed to patients within private and public urology/uro-oncology clinics when first scheduled for radical prostatectomy, and at hospital pre-admission clinics as a back-up. Content headings included 'What is pelvic floor muscle training?', 'When should I start pelvic floor muscle training?' and 'Where can I get help and advice about pelvic floor muscle training?'. The guide did not include information on how to do pelvic floor muscle exercises. It had space on the reverse for the contact details of a recommended PFMT provider.

Urologists and their administrative staff were initially (from April 2012) provided with guides 'pre-branded' for the audited PFMT providers, as well as 'unbranded' guides, to which they could attach the details of other PFMT providers. At approximately monthly intervals from the end of April 2012 to the end of December 2012, we conducted audits of the numbers of guides distributed at the aforementioned clinics. Thus we were able to ascertain overall guide usage, clinics' need for replacement guides and overall referral patterns (i.e. to whom patients were referred).

### Evidence summary

We created a two-page 'evidence summary' of randomized controlled trials supporting preoperative PFMT for men undergoing radical prostatectomy [10–13,23]. The evidence summary was presented at a urology clinical services meeting in April 2012, and copies were distributed to, and discussed in person with, local urologists.

### Audit and feedback newsletters and presentations

At ~3-month intervals from May 2011 to August 2012, we produced newsletters outlining study progress, including current data on provision/receipt of preoperative PFMT. Newsletters were distributed to all local stakeholders, including urologists and PFMT providers. The contents of the newsletters were also presented at contemporaneous urology clinical services meetings.

### Provider directory

We produced a hard-copy directory of local providers of PFMT for men, including all public sector providers and those

private sector providers of PFMT nominated by local urologists. The directory also included links to online directories of PFMT providers maintained by the Australian Physiotherapy Association and the Continence Foundation of Australia. In April 2012, directories were distributed to potential referrers of men to PFMT, including urologists, their administrative staff, hospital pre-admission clinics and senior urological nursing staff.

### Data Analysis

The statistical software package IBM SPSS Statistics Version 20 was used to analyse data. Two-tailed tests with a 5% significance level were used throughout. Unless otherwise stated, data are presented as mean (SD) values. Simple descriptive statistics were used to summarize demographic survey data. Independent samples *t*-tests were used for all comparisons of quantitative survey data. These comparisons (e.g. of ICIQ-SF sum score) included: (i) pre- vs post-intervention comparisons of all respondents; (ii) comparisons of respondents receiving vs those not receiving preoperative PFMT; and (iii) comparisons of public hospital vs private hospital respondents. Fisher's exact test was used for all comparisons of proportionate data.

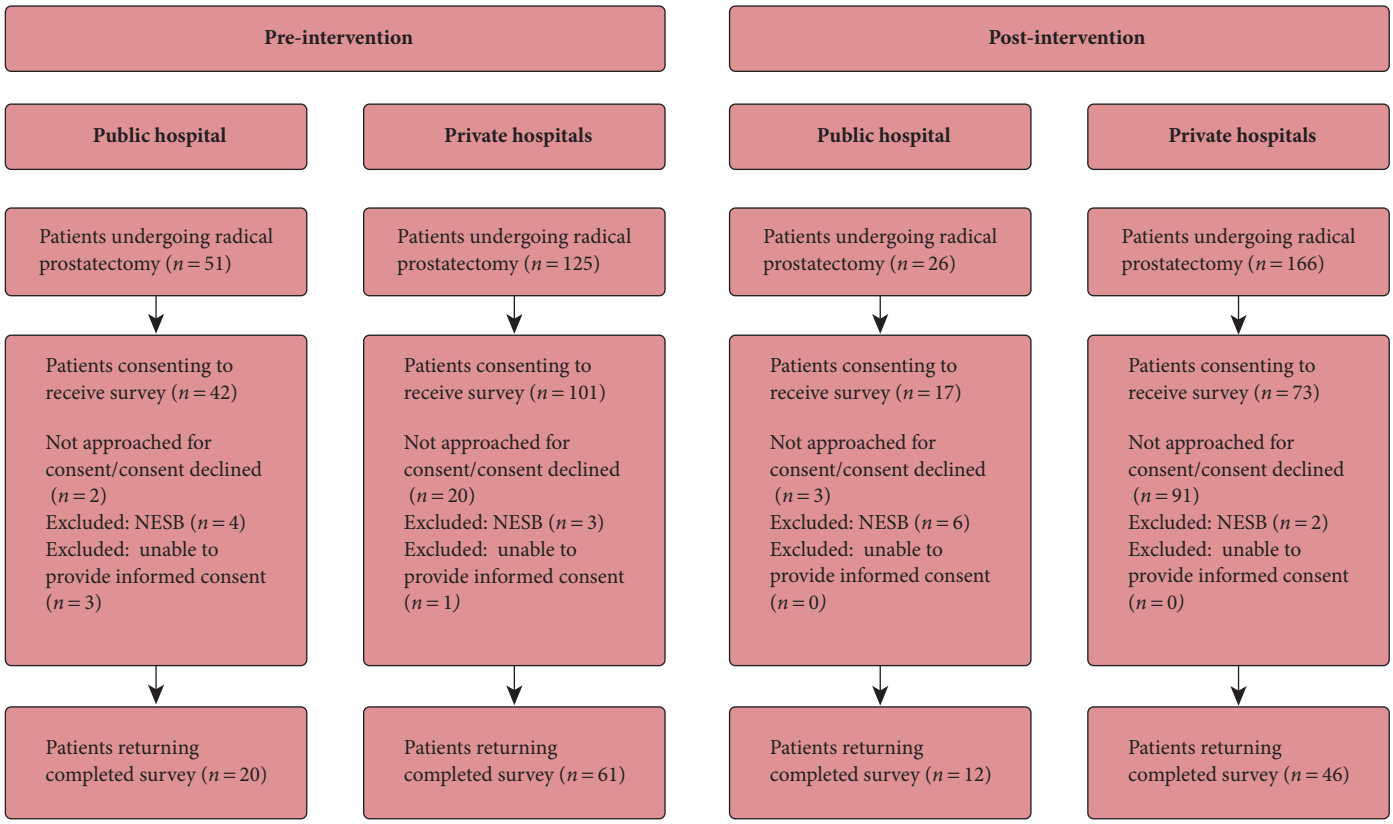
Independent samples *t*-tests were used to compare monthly practice audit data, pre-intervention vs post-intervention, on the number of men seen for preoperative PFMT, and the number of men seen for postoperative PFMT alone. Comparisons were performed for all patients and for public hospital vs private hospital patient subgroups.

## Results

### Survey Data

Figure 1 is a flowchart of the numbers of patients undergoing radical prostatectomy and consenting to receive and returning surveys, pre-intervention and post-intervention. There was no significant increase in the total number of radical prostatectomies performed post-intervention (pre-intervention: mean [SD] 19.6 [5.8] patients/month vs post-intervention: mean [SD] 21.3 [4.3] patients/month, $P = 0.470$). Given the unavailability of 4 months' pre-intervention data from Private 2 (August to December 2011 inclusive), a possible decrease in the total number of radical prostatectomy numbers performed post-intervention cannot be excluded. There was a significant reduction in the mean [SD] number of patients having radical prostatectomy in the public hospital in

**Fig. 1** Flowchart of the numbers of patients consenting to receive and returning surveys pre- and post-intervention. NESB, non-English-speaking background.



the post-intervention period (pre-intervention: 5.7 [2.0] patients/month vs post-intervention: 2.9 [1.7] patients/month, $P = 0.006$).

The overall response rate to posted surveys was 139/232 (60%). There was no significant difference in response rates between public and private hospital patients ($P = 0.356$). A significantly lower proportion of private hospital patients were approached to provide/provided consent to receive the survey post-intervention ($P < 0.001$), attributed by the relevant third parties to the limited 'in-hospital' timeframe in which to approach patients undergoing robot-assisted radical prostatectomy.

## Demographic and Insurance Data

The mean (SD; range) age of respondents was 63 (7; 43–77) years. There was no significant difference in age between public and private hospital respondents ($P = 0.851$). A total of 128 respondents (92%) lived in the Sydney metropolitan area and 11 respondents (8%) lived in rural or regional areas.

Of the 107 respondents undergoing surgery in the private hospitals, 100 (93%) reported having private health insurance. Of the 32 respondents undergoing surgery in the public hospital, four (13%) reported having private health insurance; a further 11 (34%) were admitted to the public hospital as 'private' patients, enabling choice of surgeon. Of the combined 104 respondents with private health insurance, 85 had extras cover, 16 did not have extras cover and three did not know.

Table 1 shows the proportions of respondents receiving preoperative PFMT and postoperative PFMT alone, pre-intervention and post-intervention, for all respondents and for public and private hospital respondent subgroups. Of the total 79 respondents receiving preoperative PFMT, 77 (97%) indicated having been referred by their urologist. Five (6%) indicated having been referred by a physiotherapist (respondents could indicate more than one referrer), one respondent (1%) 'self-referred', and one respondent (1%) did not specify their referrer.

## Continence Outcome Data

There was no significant difference in mean (SD) ICIQ-SF sum-score for all respondents pre-intervention vs post-intervention: pre-intervention: 7.8 (5.6) vs post-intervention: 7.0 (5.4), $P = 0.368$. Respondents receiving preoperative PFMT had significantly lower mean [SD] ICIQ-SF sum-scores than respondents not receiving preoperative PFMT (preoperative PFMT: 6.2 [5.0] vs no preoperative PFMT: 9.2 [5.8], $P < 0.001$) and respondents receiving postoperative PFMT alone (PFMT alone: 11.3 [5.7], $P < 0.001$). The significant difference in ICIQ-SF sum-scores between respondents receiving/not receiving PFMT persisted after including only those respondents ($n = 87$) operated on after the establishment of robot-assisted radical prostatectomy ($P = 0.011$), but not including only those respondents operated on at Private 2 ($P = 0.457$).

## Satisfaction Data

A total of 118 respondents (85%) completed the question 'How satisfied are you with the treatment you received (for leaking of urine)?' and 17 respondents (12%) indicated that the question was 'not applicable (I received no treatment)', eight of whom (6%) had previously indicated receiving preoperative PFMT. Four of these eight men had an ICIQ-SF sum-score of 0. A significantly higher proportion of post-intervention respondents (37/48, 77%) than pre-intervention respondents (41/70, 59%) were satisfied with the treatment they received ($P = 0.048$). A significantly higher proportion of respondents receiving preoperative PFMT (54/69, 78%) than respondents not receiving preoperative PFMT (24/49, 49%) were satisfied with the treatment they received ($P = 0.002$).

A total of 118 respondents (85%) completed the question 'How satisfied are you with the effect of your treatment (for leaking of urine)?'. There was no significant difference in the proportion of all respondents satisfied with the effect of treatment pre-intervention (40/70, 57%) vs post-intervention (35/48) ($P = 0.119$). A significantly higher proportion of respondents receiving preoperative PFMT (50/69, 72%) than

**Table 1** Proportions of respondents receiving preoperative PFMT and postoperative PFMT alone, pre-intervention and post-intervention, for all respondents and for public and private hospital respondent subgroups.

| | Pre-intervention, *n*/*N* (%) | | | Post-intervention, *n*/*N* (%) | | |
|---|---|---|---|---|---|---|
| | Preoperative PFMT | Postoperative PFMT alone | Pre- or postoperative PFMT | Preoperative PFMT | Postoperative PFMT alone | Pre-or postoperative PFMT |
| Public hospital respondents | 1/20 | 3/20 | 4/20 | 6/12† | 0/12 | 6/12 |
| Private hospital respondents | 36/61 (59)* | 14/61 (23) | 50/61 (82)* | 36/46 (78)† | 2/46 (4)† | 38/46 (83) |
| All respondents | 37/81 (46) | 17/81 (21) | 54/81 (67) | 42/58 (72)† | 2/58 (3)† | 44/58 (76) |

*P < 0.001 vs public hospital respondents; †P < 0.05 vs pre-intervention.

respondents not receiving preoperative PFMT (25/49, 51%) were satisfied with the effect of treatment ($P = 0.021$).

## Health-Related Quality-of-Life Data

Table 2 shows the mean subscale scores for the SF-36 for respondents receiving preoperative PFMT, those not receiving preoperative PFMT, and all respondents, pre- and post-intervention.

## Practice Audits

Figure 2A,B shows month-by-month numbers of patients provided with preoperative PFMT and postoperative PFMT alone, respectively, separated by private vs public hospital.

There was a significant increase in the mean [SD] number of patients provided with preoperative PFMT post-intervention (pre-intervention: 12.1 [3.6] patients/month vs post-intervention: 16.7 [3.7] patients/month, $P = 0.018$). Subgroup analysis showed a significant increase in the mean [SD] number of private hospital patients provided with preoperative PFMT (pre-intervention: 11.1 [3.8] patients/month vs post-intervention: 15.7 [4.2] patients/month, $P = 0.027$), but no significant difference in the mean [SD] number of public hospital patients (pre-intervention: 1.0 [1.2] patients/month vs post-intervention: 1.0 [0.9] patients/month, $P = 1.00$). The two private sector physiotherapy providers accounted for 100% of preoperative PFMT provision.

**Table 2** Subscale scores for the SF-36 for respondents receiving preoperative PFMT, not receiving preoperative PFMT, and all respondents, pre- and post-intervention.

| | Mean (SD) score pre-intervention | | | Mean (SD) score post-intervention | | |
|---|---|---|---|---|---|---|
| | Preoperative PFMT, *n* = 37 | No preoperative PFMT, *n* = 44 | All patients, *n* = 81 | Preoperative PFMT, *n* = 41 * | No preoperative PFMT, *n* = 16 | All patients, *n* = 57 * |
| Physical function | 86 (16) | 80 (23) | 83 (20) | 84 (22) | 88 (12) | 85 (20) |
| Role: physical | 65 (40) | 56 (42) | 60 (41) | 65 (42) | 67 (45) | 65 (43) |
| Role: emotional | 74 (41) | 73 (41) | 73 (41) | 74 (39) | 81 (34) | 76 (37) |
| Energy/fatigue | 70 (20) | 58 (21)† | 64 (21) | 69 (18) | 70 (18) | 69 (18) |
| Mental health | 81 (16) | 74 (20) | 77 (19) | 81 (13) | 82 (18) | 82 (14) |
| Social function | 84 (21) | 74 (23)† | 78 (23) | 79 (24) | 79 (26) | 79 (24) |
| Bodily pain | 81 (23) | 75 (26) | 78 (25) | 88 (17) | 92 (17) | 89 (17)‡ |
| General health | 78 (20) | 72 (20) | 75 (20) | 73 (17) | 78 (14) | 74 (16) |

**One patient did not complete the SF-36. †P < 0.05 vs preoperative PFMT; ‡P < 0.01 vs pre-intervention.*

**Fig. 2** (**A**) Month-by-month numbers of patients provided with preoperative PFMT, pre-intervention (months 1 to 9 inclusive) and post-intervention (months 10 to 18 inclusive), separated by private vs public hospital (numbers 'stacked'). (**B**) Month-by-month numbers of patients provided with postoperative PFMT alone, pre-intervention (months 1 to 9 inclusive) and post-intervention (months 10 to 18 inclusive), separated by private vs public hospital (numbers 'stacked').

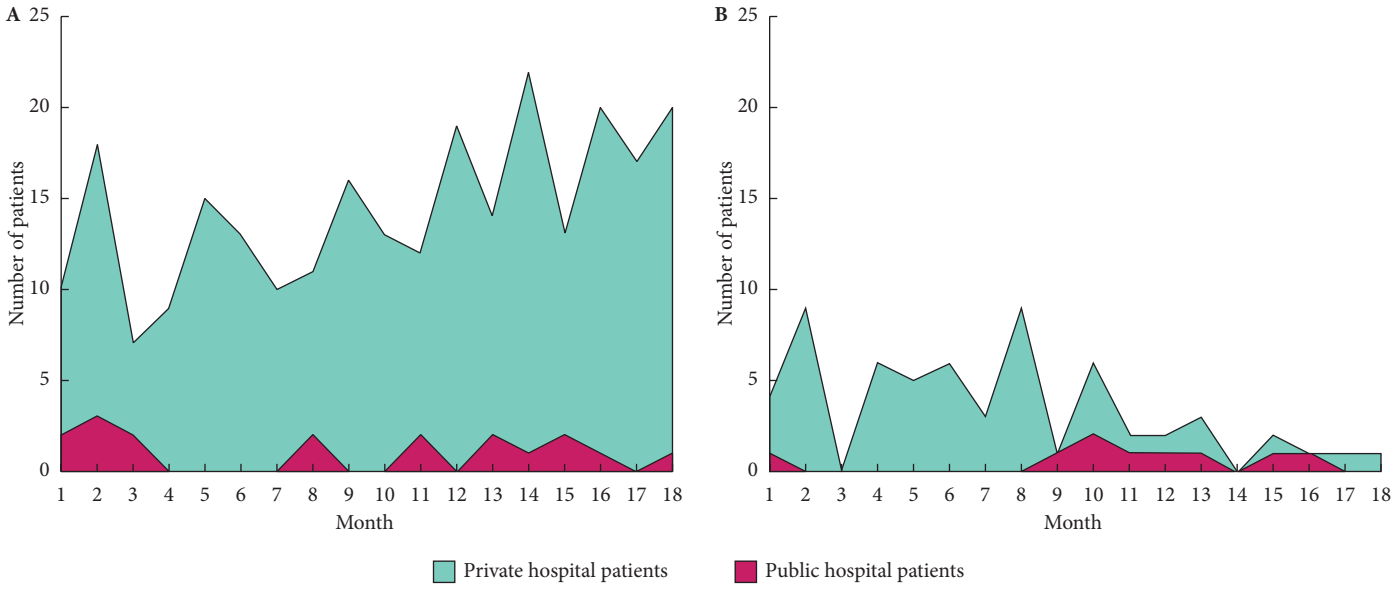


**Table 3** Numbers of patient information guides distributed through urology/uro-oncology and hospital preadmission clinics over the 9-month post-intervention period, stratified by clinic and 'recommended' provider.

| | 'Recommended' provider | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Private physiotherapy practice 1 | Private physiotherapy practice 2 | Public continence clinic 1 | Public continence clinic 2 | Public pelvic floor clinic | Public physiotherapy department | Unbranded | |
| Private urology/uro-oncology clinics | 143 | 10 | 1 | 0 | 0 | 0 | 0 | 154 |
| Public urology/uro-oncology clinics | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 |
| Private hospital (Private 1 and 2) preadmission clinics | 3 | 0 | 0 | 0 | 0 | 0 | 18 | 21 |
| Public hospital (Public 1) preadmission clinic | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| Total | 146 | 10 | 1 | 0 | 5 | 0 | 29 | 191 |

There was a significant decrease in the mean [SD] number of patients provided with postoperative PFMT alone post-intervention (pre-intervention: 4.8 [3.2] patients/month vs post-intervention: 2.0 [1.7] patients/month, $P = 0.034$). The two private sector physiotherapy providers accounted for 85% (52/61 patients) of postoperative PFMT alone provision.

### Audits of Patient Information Guides

Table 3 shows the number of patient information guides distributed through urology/uro-oncology and hospital preadmission clinics over the 9-month post-intervention period, stratified by clinic and 'recommended' provider. A total of 191 guides were distributed, 156 (86%) to private sector physiotherapy providers.

## Discussion

The primary aim of the current study was to assess the efficacy of a multicomponent, theory-based intervention in the provision/receipt of preoperative PFMT among men undergoing radical prostatectomy. The post-intervention period saw a 57% increase in the proportion of patients (survey respondents) who reported having received preoperative PFMT (from 46 to 72%), and a 38% increase in the number of patients presenting to local providers for preoperative PFMT. We consider this degree of improvement in the provision/receipt of preoperative PFMT to justify the intervention, noting that trials of similar multicomponent interventions, albeit in other clinical settings, resulted in a median 4–22% change in uptake of clinical evidence [24]. We have been unable to find published data on the provision/receipt of preoperative PFMT against which to compare our post-intervention data.

The improvement in provision/receipt of PFMT was seen in both private and public hospital subgroups. Nonetheless, subgroup analysis (private vs public hospital patients, private vs public sector providers) provides an indication of the relative contributions of the component interventions to overall improvement. Few previous studies have investigated the effect of patient education strategies (e.g. patient information guides) specifically on the subsequent uptake of preoperative treatments [25]; however, circumstantial evidence indicates that the patient information guides in general, and particularly those 'branded' to a private provider of PFMT, were an effective component of the intervention. An almost one-to-one correspondence between the number of guides distributed (191) and post-intervention surgical numbers (192) suggests strong adherence by the various clinics to guide distribution. A similar correspondence between the branding of distributed guides (almost exclusively private sector), and the ultimate providers of preoperative PFMT (exclusively private sector), in turn suggests adherence by patients to the contained advice.

We developed the provider directory specifically in response to the finding (in our preliminary barrier analysis) that urologists' knowledge of public sector providers of PFMT was limited. That not one of the local public providers was called upon to provide preoperative PFMT over the post-intervention period suggests either that the directory was an insufficient means of publicizing their services or that other barriers, e.g. geographical location of public providers, are also crucial. Given that the absolute numbers and proportion of public hospital patients receiving preoperative PFMT remained relatively low post-intervention, there probably remains a role for public providers of PFMT, although additional intervention components may be required to encourage referrals. It is noteworthy that over the study period a decreasing minority of patients underwent radical prostatectomy in the public hospital, probably as a consequence of the unavailability of robot-assisted radical prostatectomy.

The contributions of the other intervention components to the improvement in the provision/receipt of preoperative PFMT are difficult to assess. A Cochrane review of printed educational

materials for clinicians, such as the evidence summary, found that these may result in 'modest but potentially important' improvements in professional practice [26]. It is instructive that the evidence summary in the current study emphasized the role of preoperative PFMT, as distinct from postoperative PFMT; survey and practice audit data suggest that much of the improvement in receipt of preoperative PFMT did come at the expense of patients presenting for postoperative physiotherapy alone. The evidence summary may have encouraged urologists to more strongly consider prophylactic PFMT for their patients, rather than delay referral until PPUI presented. The publication of a large negative trial of postoperative PFMT in July 2011 may also have contributed [6]. We note that 97% of survey respondents receiving preoperative PFMT indicated having been referred by their urologist, suggesting the evidence summary was appropriately directed.

The audit and feedback processes (newsletters/presentations) may have had contradictory effects on study outcomes. While audit and feedback has been shown to lead to small improvements in professional practice, effectiveness varies according to both baseline performance and the method of audit/feedback delivery [27]. As our newsletters/presentations had the dual roles of promoting the research to key stakeholders (including during the pre-intervention period) and reporting progressive outcomes, they may have artificially raised pre-intervention referrals to preoperative PFMT. Unfortunately historical data on the provision/receipt of preoperative PFMT are not available. External to his research role, one of the current authors (A.D.H.) works as a physiotherapist with the private sector providers audited in the study (albeit not providing PFMT), which may have promoted referrals independently of the presented data.

The components of the intervention were inexpensive and simple to deliver. After designing them, the printing of patient information guides cost ~ AUD$2.00/unit. Printing of the provider directory cost ~AUD$20.00/unit; similar directories, certainly in Australia, are freely accessible online [28,29]. Production of the evidence summary and audit and feedback processes involved researcher work-time, although not more than incurred in standard clinical audit processes. In other clinical settings where there exist appropriately trained physiotherapists/nurses, implementation of the described intervention is therefore considered feasible. Other clinical settings may, however, present different and/or additional barriers, warranting local modification to the intervention [30].

Patients in the current study were not randomized to receive or not to receive PFMT. Notwithstanding, the finding that respondents receiving preoperative PFMT reported significantly lower urinary incontinence/related bother than those receiving postoperative PFMT alone, and those not receiving PFMT, provides qualified support to the primary evidence upon which the study was predicated [10–13]. A confounding factor is that post-intervention a greater proportion of patients both received preoperative PFMT and had robot-assisted radical prostatectomy. We were unable to collect objective data on PPUI, e.g. pad-test data, but the mean (SD) ICIQ-UI Short Form sum-score of 6.2 (5.0) for those receiving preoperative PFMT was lower, i.e. better, than that reported in the treatment arm of the one trial of preoperative PFMT that used this outcome measure [11]. The proportion of completely continent respondents, i.e. those with an ICIQ-UI Short Form sum-score = 0, (13/79, 16%) was, however, considerably lower than that reported in the treatment arm of another trial (8/16, 50%) [13].

The novel findings of the current study are that those respondents receiving preoperative PFMT also reported significantly better HR-QoL (specifically energy/fatigue), and significantly greater satisfaction with treatment of PPUI and its effects, 3 months after surgery. Interestingly, those questions on the SF-36 addressing energy/fatigue relate to respondents' 'feelings' of wellbeing, rather than the social or functional limitations more commonly discussed as consequences of PPUI [8]. Of the five randomized trials comparing preoperative PFMT with no-PFMT controls, only one reported generic HR-QoL, finding no significant between-group differences 6 months after surgery [10]. None of the trials reported patient satisfaction.

## Limitations

We note that the current study was a 'before and after' cohort-study, and that the intervention was not randomized across hospital settings or at the individual level. As such, the effects of the intervention cannot be dissociated from potential effects of changes in the clinical/research environment over the study period, e.g. the establishment of the robot-assisted prostatectomy services at Private 2 (August 2011) and ultimately Private 1 (December 2012). A cluster-randomized trial was beyond the scope of the research funding and timeframe; the fact that the local urologists worked at various other hospitals across Sydney would, in any case, have made it difficult to avoid 'cross-contamination' of the intervention.

We encountered difficulties with the survey consent process at Private 2. As a result, a disproportionate number of public vs private surveys were mailed post-intervention; statistical power of the study was also reduced. Ethical concerns precluded a direct approach to potential participants by the researchers, hence the use of third parties to obtain patient consent.

The response rates to posted surveys were similar to those reported in a review of postal survey studies (60 ± 21%) [31]. We used recommended strategies, e.g. University-identified envelopes, pre-paid return envelopes [32], to improve

response rates; nonetheless, with a non-response rate of 40%, even amongst those consenting to receive the survey, we cannot rule out a non-response bias. Furthermore, as with survey-based research generally, we were unable to confirm respondents' data. There was some evidence that questions may have been misinterpreted, e.g. in those respondents reporting having received PFMT, but disclaiming having received treatment when asked to rate associated satisfaction.

Robot-assisted prostatectomy was not available to patients in our centre at the time of study conception/commencement. As such, the survey did not canvass surgical technique, and we were unable to assess the effect of surgical technique (e.g. robot-assisted vs non-robot-assisted prostatectomy) on PPUI and HR-QoL. Unfortunately the anonymous nature of the survey precluded linkage with surgical data, such as technique and other factors (bladder neck preservation, preservation of the neurovascular bundle *inter alia*) that have been shown to affect PPUI [2,33].

In conclusion, a multicomponent, theory-based intervention, informed by a qualitative analysis of local barriers and enablers, was effective in improving the provision/receipt of preoperative PFMT among patients undergoing radical prostatectomy in a combined public/private sector urological cancer centre. Moreover, patients receiving preoperative PFMT reported lower early postoperative PPUI symptoms/impact, and were more likely to be satisfied with treatment for PPUI and its effects. While a small and decreasing minority of patients in this centre had surgery in the public hospital, further research is warranted to address the extant 50% of these patients (and 28% of all patients) not receiving preoperative PFMT, and the perhaps corresponding underuse of public sector PFMT providers.

## Acknowledgements

The authors would like to acknowledge all respondents for their participation in the study, and the staff at participating hospitals and providers for their support of the study and assistance with consent and audit procedures. A.D.H. was funded through a National Health and Medical Research Council (NHMRC) Translating Research Into Practice (TRIP) Fellowship.

## Conflict of Interest

A.D.H. is an employee of Westmead Private Physiotherapy Services, one of the audited providers of PFMT in the study.

## References

1 **Sacco E, Prayer-Galetti T, Pinto F et al.** Urinary incontinence after radical prostatectomy: incidence by definition, risk factors and temporal trend in a large series with a long-term follow-up. *BJU Int* 2006; 97: 1234–41

2 **Berryhill R Jr, Jhaveri J, Yadav R et al.** Robotic prostatectomy: a review of outcomes compared with laparoscopic and open approaches. *Urology* 2008; 72: 15–23

3 **Herschorn S, Bruschini H, Comiter C, Grise P, Hanus T, Kirschner-Hermanns R.** Surgical treatment of urinary incontinence in men. In Abrams P, Cardozo L, Khoury S, Wein A eds, *4th International Consultation on Incontinence*, Paris: Health Publication Ltd., 2009: 1121–90

4 **Smith DP, King MT, Egger S et al.** Quality of life three years after diagnosis of localised prostate cancer: population based cohort study. *BMJ* 2009; 339: b4817

5 **Bauer RM, Gozzi C, Hubner W et al.** Contemporary management of postprostatectomy incontinence. *Eur Urol* 2011; 59: 985–96

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

7 **Sanda MG, Dunn RL, Michalski J et al.** Quality of life and satisfaction with outcome among prostate-cancer survivors. *N Engl J Med* 2008; 358: 1250–61

8 **Herr HW.** Quality of life of incontinent men after radical prostatectomy. *J Urol* 1994; 151: 652–4

9 **Campbell SE, Glazener CM, Hunter KF, Cody JD, Moore KN.** Conservative management for postprostatectomy urinary incontinence. *Cochrane Database Syst Rev* 2012; (1): CD001843

10 **Burgio KL, Goode PS, Urban DA et al.** Preoperative biofeedback assisted behavioral training to decrease post-prostatectomy incontinence: a randomized, controlled trial. *J Urol* 2006; 175: 196–201

11 **Centemero A, Rigatti L, Giraudo D et al.** Preoperative pelvic floor muscle exercise for early continence after radical prostatectomy: a randomised controlled study. *Eur Urol* 2010; 57: 1039–43

12 **Parekh AR, Feng MI, Kirages D, Bremner H, Kaswick J, Aboseif S.** The role of pelvic floor exercises on post-prostatectomy incontinence. *J Urol* 2003; 170: 130–3

13 **Tienforti D, Sacco E, Marangi F et al.** Efficacy of an assisted low-intensity programme of perioperative pelvic floor muscle training in improving the recovery of continence after radical prostatectomy: a randomized controlled trial. *BJU Int* 2012; 110: 1004–10

14 **Goode PS.** Editorial Comment: efficacy of an assisted low-intensity programme of perioperative pelvic floor muscle training in improving the recovery of continence after radical prostatectomy: a randomized controlled trial. *BJU Int* 2012; 110: 1010–1

15 **Nahon I, Waddington GS, Dorey G, Adams R.** Assessment and conservative management of post-prostatectomy incontinence after radical prostatectomy. *Aust NZ Continence J* 2009; 15: 70–7

16 **Avery K, Donovan J, Peters TJ, Shaw C, Gotoh M, Abrams P.** ICIQ: a brief and robust measure for evaluating the symptoms and impact of urinary incontinence. *Neurourol Urodyn* 2004; 23: 322–30

17 **Hays RD, Sherbourne CD, Mazel RM.** The RAND 36-Item Health Survey 1.0. *Health Econ* 1993; 2: 217–27

18 **Hall SE, D'Arcy C, Holman J, Wisniewski SZ, Semmens J.** Prostate cancer: socio-economic, geographical and private-health insurance effects on care and survival. *BJU Int* 2005; 95: 51–8

19 **Gallina A, Karakiewicz PI, Chun FK-H et al.** Health-insurance status is a determinant of the stage at presentation and of cancer control in European men treated with radical prostatectomy for clinically localized prostate cancer. *BJU Int* 2007; 99: 1404–8

20 **Ware JE, Snow KK, Kosinski M, Grandek B.** *SF-36® Health Survey Manual and Interpretation Guide*. Boston: The Health Institute, 1993

21 **Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A.** Making psychological theory useful for implementing evidence based practice: a consensus approach. *Qual Saf Health Care* 2005; 14: 26–33

22 **French SD, Green SE, O'Connor DA, McKenzie JE, Francis JJ, Michie S.** Developing theory-informed behaviour change interventions to implement evidence into practice: a systematic approach using the Theoretical Domains Framework. *Implement Sci* 2012; 7: 38

23 **Sueppel C, Kreder K, See W.** Improved continence outcomes with preoperative pelvic floor muscle strengthening exercises. *Urol Nurs* 2001; 21: 201–10

24 **Grimshaw JM, Thomas RE, MacLennan G et al.** Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technol Assess* 2004; 8: 1–72

25 **Ronco M, Iona L, Fabbro C, Bulfone G, Palese A.** Patient education outcomes in surgery: a systematic review from 2004 to 2010. *Int J Evid Based Healthc* 2012; 10: 309–23

26 **Giguere A, Legare F, Grimshaw J et al.** Printed educational materials: effects on professional practice and healthcare outcomes. *Cochrane Database Syst Rev* 2012; (10): CD004398

27 **Ivers N, Jamtvedt G, Flottorp S et al.** Audit and feedback: effects on professional practice and healthcare outcomes. *Cochrane Database Syst Rev* 2012; (6): CD000259

28 **Australian Physiotherapy Association.** Find a Physio [Internet] 2012 [cited 2012 Mar 1]. Available from: http://www.physiotherapy.asn.au/APAWCM/Controls/FindaPhysio.aspx

29 **Continence Foundation of Australia.** Search for a service provider [Internet] 2012 [cited 2012 Mar 1]. Available from: http://www.continence.org.au/service-providers.php

30 **Wensing M, Bosch M, Grol R.** Developing and selecting interventions for translating knowledge to action. *CMAJ* 2010; 182: E85–8

31 **Asch DA, Jedrziewki MK, Christakis NA.** Response rates to mail surveys published in medical journals. *J Clin Epidemiol* 1997; 50: 1129–36

32 **Edwards P, Roberts I, Clarke M et al.** Increasing response rates to postal questionnaires: systematic review. *BMJ* 2002; 324: 1183

33 **Kim SC, Song C, Kim W et al.** Factors determining functional outcomes after radical prostatectomy: robot-assisted versus retropubic. *Eur Urol* 2001; 60: 413–9


Correspondence: Andrew Hirschhorn, Westmead Private Physiotherapy Services, Suite 6, 16 to 18 Mons Road, Westmead, NSW 2145, Australia.

e-mail: andrew.hirschhorn@me.com

Abbreviations: PFMT, pelvic floor muscle training; ICIQ-UI Short Form, International Consultation on Incontinence Questionnaire – Urinary Incontinence Form; PPUI, post-prostatectomy urinary incontinence; HR-QoL, health-related quality of life; SF-36, RAND 36-item Short Form Health Survey 1.0.