What Makes Men Leak?

An Analysis of 1 Hour and 24 Hour Pad Tests After Radical Prostatectomy

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Introduction

- Physiotherapists use 1 hour and 24 hour pad tests (1HPT, 24HPT) to quantify leakage of urine in men after radical prostatectomy.[1] These pad tests measure **overall** urine leakage in response to a set of physical activities over time.
- Pelvic floor muscle training for men having radical prostatectomy, however, involves teaching men to contract the pelvic floor muscles in anticipation of **specific** physical activities that might precipitate leakage of urine.
- The goal of pelvic floor muscle training before and after radical prostatectomy is to reduce the severity and duration of post-prostatectomy urinary incontinence.

The aims of this study were:

- To determine the relative contributions of the **individual** physical activities comprising the 1HPT to overall leakage of urine after radical prostatectomy; and
- To compare the 1HPT and 24HPT with a self report measure of urinary incontinence, the International Consultation on Incontinence Questionnaire – Short Form (ICIQ-SF)[2], after radical prostatectomy.

Methods

Men performed a 1HPT and a 24HPT, and completed the ICIQ-SF, at 3 and 6 weeks postoperatively.

Study Participants

Men (n=15) having radical prostatectomy under the care of one urological cancer surgeon (MP) across three private hospitals in Sydney, and presenting for perioperative pelvic floor muscle training at Westmead Private Physiotherapy Services (see table below).

Age (y)	60 ± 7
Height (m)	1.75 ± 0.05
Weight (kg)	89 ± 10
BMI (kg.m^{-2})	28.9 ± 3.2
Preoperative PSA (ng/mL)	5.1 ± 3.3
cTNM	
T1c	0 (0%)
T2a	4 (27%)
T2b	5 (33%)
T2c	1 (7%)
T3a	4 (27%)
T3b	1 (7%)
Gleason Score	
3+3	2 (13%)
3+4	11 (73%)
4+3	2 (13%)
4+4	0 (0%)
Type of surgery (retropubic:robotic)	7:8
Nerve sparing (no:1-sided:2-sided)	2:0:12
Pelvic lymph node dissection (no:yes)	9:6
Duration of postoperative catherisation (d)	10 ± 2

The 1HPT

The 1HPT was performed at Westmead Private Physiotherapy Services. Men performed the following physical activities over a one hour period:

1. Drinking 500mL of water while resting, seated, for 15 minutes
2. Walking on a treadmill at a comfortable speed, for 30 minutes
3. Standing up and sitting down, 10 times
4. Coughing vigorously in a standing position, 10 times
5. Running on the spot, for 1 minute
6. Bending down to pick an object from the floor, 5 times
7. Washing hands under running water, for 1 minute

Men wore a new continence pad for each physical activity performed during the 1HPT. Pads were weighed separately and together to provide activity-specific and overall measures of leakage.

The 24HPT

Men performed the 24HPT the day before the 1HPT. Men were given a set of preweighed pads, supplied in individual zip-locked bags – used and unused pads were returned to Westmead Private Physiotherapy Services for reweighing.

The ICIQ-SF

Men were asked to complete the ICIQ-SF immediately before the 1HPT. The ICIQ-SF provides a measure of patient-perceived urine leakage and related bother, between '0', reflecting no leakage and related bother, and '21', reflecting severe leakage and related bother.

Results

- Overall leakage for the 1HPT was 15 ± 30 mL at 3 weeks and 7 ± 8 mL at 6 weeks postoperatively (p = 0.32).
- Walking on a treadmill (3 weeks: 35 ± 15%, 6 weeks: 35 ± 20%), running on the spot (3 weeks: 14 ± 24%, 6 weeks: 13 ± 11%) and coughing (3 weeks: 12 ± 16%, 6 weeks: 12 ± 15%) were the greatest contributors to overall leakage (Figures 1 and 2). There was significant correlation between overall leakage as measured by the 1HPT and 24HPT at 3 weeks postoperatively (r = 0.98, p < 0.01), but not at 6 weeks postoperatively (r = 0.21, p = 0.46).
- There was no significant correlation between overall leakage as measured by the 1HPT and the ICIQ-SF at either 3 weeks (r = 0.41, p = 0.14) or 6 weeks (r = 0.02, p = 0.94) postoperatively (Figure 3).
- There was no significant correlation between overall leakage as measured by the 24HPT and the ICIQ-SF at either 3 weeks (r = 0.39, p = 0.17) or 6 weeks (r = 0.29, p = 0.29) postoperatively (Figure 4).

Figure 1
Contribution of Specific Activities to Overall 1HPT Leakage 3 Weeks Postoperative

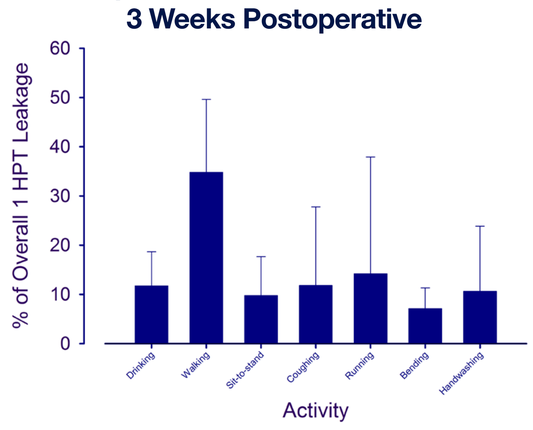


Figure 2
Contribution of Specific Activities to Overall 1HPT Leakage 6 Weeks Postoperative

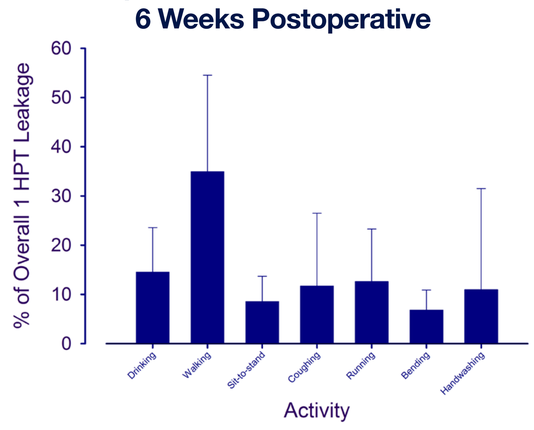


Figure 3
ICIQ-SF vs 1HPT
3 Weeks (blue) and 6 Weeks (yellow) Postoperative

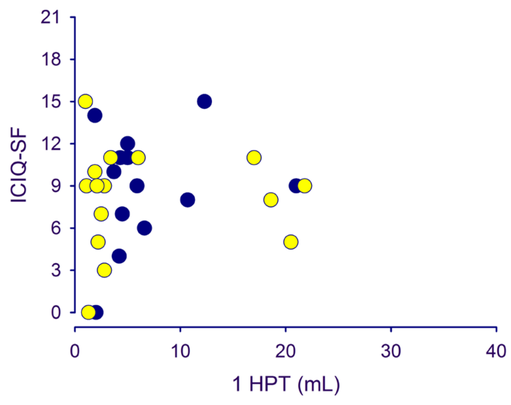
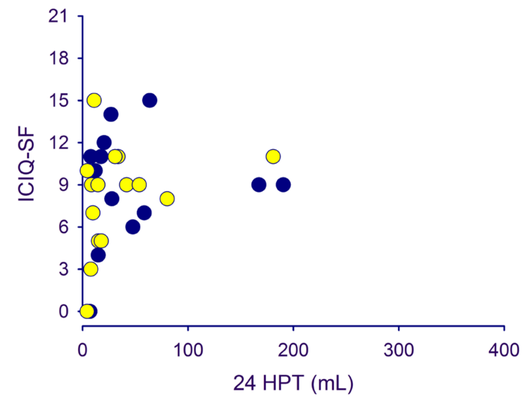


Figure 4
ICIQ-SF vs 24HPT
3 Weeks (blue) and 6 Weeks (yellow) Postoperative



Conclusions

- Walking and running on the spot are significant contributors to urine leakage in the first six weeks after radical prostatectomy.
- Training men to specifically contract the pelvic floor muscles before and during walking and running may reduce overall urinary leakage.
- Comprehensive assessment of urinary incontinence in men after radical prostatectomy should include pad tests and self report measures.

REFERENCES:
1. The standardization of terminology of lower urinary tract function. Brit J Obstet Gynaec. 1990;S6:1-16. 2. Avery K, Donovan J, Peters T, et al. ICIQ: a brief and robust measure for evaluating the symptoms and impact of urinary incontinence. *Neurourol Urodyn*. 2004;23:322-30.