

## **Pelvic Physical Therapy Distance Journal Club**

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Preoperative exercise interventions to optimize continence outcomes following radical prostatectomy.

Mungovan SF, Carlsson SV, Gass GC, et al. Nat Rev Urol 2021;18(5):259-281.

Doi:10.1038/s41585-021-00445-5.

### **Introduction**

- Estimated 1,414,259 new cases of prostate cancer in 2020, globally
- Higher prevalence in developed countries with highest rates in Australia and New Zealand, North America, Western and Northern Europe and the Caribbean with increasing rates in Eastern Europe, the Middle East, North Africa, and Central and South America
- Classification methods include tumor grade, node, metastasis stage and PSA level
- Radical prostatectomy: indicated when definitive curative treatment is required, may be used for metastatic patients to reduce disease burden and the need for palliative treatment
  - First reported in 1905 by Hugh Hampton Young
  - Surgical approaches: open retropubic, perineal, and minimal invasive laparoscopic or robotic-assisted surgery
  - Predictable functional impairments: urinary incontinence, erectile dysfunction
  - Personal and societal consequences: decrease in quality of life, decrease in psychosocial well-being, increase in use of health-care resources, lost work productivity
- Urinary incontinence (UI) post radical prostatectomy
  - Background
    - Continues UI can lead to economic, social, and psychological consequences
    - 46% of men reported pad use 6 months post prostatectomy
    - 17% of men reported pad use 6 years post prostatectomy
    - There is no standardization to quantify the degree or severity of UI post prostatectomy despite the wide-reaching consequences
    - “the return to continence should be an important point of discussion between the patient and their clinicians before and after radical prostatectomy.”
  - Predictors of poor continence outcomes: advancing age, shorter membranous urethral length (MUL), BMI, metabolic comorbidities including diabetes, lower urinary tract symptoms, lower preoperative maximal closure pressure
    - Modifiable and non-modifiable risks may motivate preoperative exercise, thus should be discussed
  - Continence may further be complicated after radical prostatectomy due to surgical trauma to sphincteric muscles, sphincteric innervation and connective tissue damage

### **Aim/Primary Aim**

To provide “state of the art and evidence base for inclusion of preoperative exercise interventions to optimize functional outcomes, particularly urinary continence, after radical prostatectomy.”

### **Study Design/Study Format**

Extensive review of radical prostatectomy including pathophysiology, risk factors, rehabilitation, prehabilitation. The review covers pelvic floor muscle training protocols including patient instructions and biofeedback and transperineal ultrasonography.

## Results

### Prehabilitation model of care

Multidisciplinary team	physical, psychological, nutritional, and behavioral care
Multisystem adaptations	musculoskeletal, cardiovascular, respiratory, neurological, metabolic, and endocrine
Exercise dose	Littel consensus on optimal pre-op or post-op dose-response relationship
Encourages self-efficacy	

### Aerobic and Resistance Exercise

American Cancer Society's aerobic guideline	150 minutes mod intensity exercise 75 minutes vigorous exercise
Resistance training study	Significant strength increases in 70-80yo men after 4 weeks
Prehab aerobic study	60 minutes mod intensity 3-4 days/week for 6 weeks. Decreased BMI and waist circumference, improved 6min walk test, reduced anxiety
Prehab aerobic and resistance study	Aerobic and resistance exercise 2x/week, significant increase in muscle strength and decreased 400m walk test time

### Pelvic floor muscle training

Results of PFM hypertrophy	Increased strength, coordination, and amplified urethral pressure
Traditional preoperative	Verbal and written instructions in static positions
Postoperative PFMT	-Primary approach -1-74 sessions required, showing variable effectiveness -No significant difference between post-op PFME and control group with risk of incontinence 3 months or long-term post-op -Under dosing is a potential limitation
Preoperative PFMT	Significant improvement in continence 3 months post-op compared to post-op PFME
Biofeedback training	-Improved continence vs PFMT without biofeedback at 3, 6, 6+ months
Verbal cues	More sensitive cues include 'draw your penis towards you as if stopping the flow of urine' or 'lift your scrotum'

### Transperineal ultrasonography

Benefits	Non-invasive, measures MUL, static and dynamic assessment, real-time
Patient comfort	-Minimal exposure, can continue to wear pad -Optional positions including standing, seated, or supine
Recommended equipment	-2D ultrasonography, cineloop function, curved array probes, 3.5-7Hz frequencies -Higher frequency linear probe transducer provides more focused image
Quantified muscle contribution	Functional contraction of striated sphincter, levator ani, puborectalis and bulbocavernosus in one display
MUL measurement	"excellent agreement with MRI measurements, excellent test-retest reliability"

Faster time to continence	PFMT with ultrasound in 76±100 days vs FRMT along at 122±132 days
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## Discussion

Many benefits can be gained from transitioning from a postoperative, reactive model of care to a preoperative radical model of care including faster return to urinary continence. This model requires a multidisciplinary team to support the preoperative model led by the surgeon through strong recommendation, mandate, and referral for preoperative interventions.

- **Strengths**
  - Comprehensive review of outlining benefits of prehabilitation with a patient focus
  - Emphasizes importance of individualizing patient care and involving them in goal setting and timeline planning
  - Highlighted importance of rehabilitation, exercise, and PFMT for radical prostatectomy patients
- **Weaknesses**
  - Did not discuss implications for care of rural patients
  - Focused on ultrasonography for biofeedback, which may not be available to clinicians
  - Outcome measures were briefly mentioned
  - Prehabilitation may not be covered for reimbursement

## Clinical Application

- Increased awareness of the psychological impacts of standard examination and the impacts of urinary incontinence and erectile dysfunction
- Advocate for transition to radical prostatectomy prehabilitation model for improved postoperative continence
- Increased use of transperineal ultrasound for PFMT preoperatively and postoperatively
- Multidisciplinary team may include surgeon, rehabilitation, mental health, nutrition, and other providers for patients with complex medical conditions

## List discussion questions

- The review stated that postoperative PFMT may be underdosed but did not provide guidance for preoperative PFMT dosage. How do you dose your preoperative patients and how may dosage differ compared to postoperative patients?
- For providers with access to rehab ultrasound, how often do you use this intervention with your radical postprostatectomy patient? And have you recognized improved continence results?
- Are there any providers whose healthcare systems deliver care utilizing a prehabilitation model and if so, how many pre-op sessions are optimal?
- This care model requires a multidisciplinary team, do many of your healthcare systems have an established prostatectomy team? If not, would you be comfortable advocating for a prehabilitation model of care?