

## W20: From pelvic floor muscle training to functional training in women with urinary incontinence; bottom line solution for adherence?

Workshop Chair: Bary Berghmans, Netherlands  
15 September 2016 09:40 - 12:30

Start	End	Topic	Speakers
09:40	09:45	introduction	Bary Berghmans
09:45	10:10	How to perform a pelvic floor muscle training and Strategies of PFME for urinary incontinence	Bary Berghmans
10:10	10:30	Beliefs and disbeliefs related to evidence of PFME and training programs	Alex Digesu
10:30	10:50	PFME for urgency urinary incontinence, why should it work?	Nucelio Lemos
10:50	11:00	Break	None
11:00	11:20	How to improve adherence? Innovative strategies	Maura Seleme
11:20	12:00	Practice of PFME	Maura Seleme
12:00	12:30	Interactive debate	All

### Aims of course/workshop

Results of new pelvic floor muscle exercises (PFME) or training programs with focus on motor control and pre-contraction will be presented. How to assess the patient, what parameters are important for the PFMT training session in patients with (predominant) stress urinary incontinence or with urgency/frequency syndromes. Performance of PFM assessment will also be demonstrated. Training strategies based on the evaluation of findings during the assessment will be shown. How to proceed from mono task exercises to fully functional activities. Using biofeedback, interpreting the signal as an adjunct to PFME or training new biofeedback strategies, procedures and equipment will be presented, including videos.

### Learning Objectives

After this workshop participants should be able to:

1. Understand the rationale and perform a structured pelvic floor muscle functional assessment
2. Based on the assessment how to select and construct a pelvic floor muscle training program
3. How to perform a functional training, importance for adherence

### Learning Outcomes

To be able to:

1. Understand and perform a structured pelvic floor muscle functional assessment
2. Based on the assessment how to select and construct a pelvic floor muscle training program
3. How to perform a functional training also stimulating adherence

### Target Audience

Gynecologists, Urologists, Nurses and Physiotherapists

### Advanced/Basic

Advanced

### Conditions for learning

Hands on course, interactive debate, practical videos no restriction in participation

### Suggested Learning before workshop attendance

- Bø Kari, Berghmans Bary, Mørkved Siv, Kampen Marijke van (Eds.) Evidence-based physiotherapy for the pelvic floor: bridging science and clinical practice. Second Edition. Philadelphia, USA: Elsevier Ltd 2014
- Several guidelines on urinary incontinence: EAU, NICE, Royal Dutch Society for Physiotherapy (<http://www.fysionet-evidencebased.nl/index.php/kngf-guidelines-in-english>), etc

### Suggested Reading

- Kulaksizoğlu H, Akand M, Çakmakçı E, Gül M, Seçkin B. Effectiveness of pelvic floor muscle training on symptoms and uroflowmetry parameters in female patients with overactive bladder. *Turk J Med Sci.* 2015;45(2):449-53
- Dumoulin C, Hay-Smith J, Frawley H, McClurg D, Alewijnse D, Bo K, Burgio K, Chen SY, Chiarelli P, Dean S, Hagen S, Herbert J, Mahfooza A, Mair F, Stark D, Van Kampen M; 2014 consensus statement on improving pelvic floor muscle training adherence: International Continence Society 2011 State-of-the-Science Seminar. *International Continence Society. Neurourol Urodyn.* 2015 Sep; 34(7):600-5. doi: 10.1002/nau.22796. Epub 2015 May 21. Review.
- Dumoulin C, Alewijnse D, Bo K, Hagen S, Stark D, Van Kampen M, Herbert J, Hay-Smith J, Frawley H, McClurg D, Dean S.

- Pelvic-Floor-Muscle Training Adherence: Tools, Measurements and Strategies-2011 ICS State-of-the-Science Seminar Research Paper II of IV.
- Neurourol Urodyn. 2015 Sep; 34(7):615-21. doi: 10.1002/nau.22794. Epub 2015 May 21. Review.
- Griffiths D, Clarkson B, Tadic SD, Resnick NM. Brain Mechanisms Underlying Urge Incontinence and its Response to Pelvic Floor Muscle Training. J Urol. 2015 Sep; 194(3):708-15. doi: 10.1016/j.juro.2015.03.102. Epub 2015 Mar 28.
- Dumoulin C, Glazener C, Jenkinson D. Determining the optimal pelvic floor muscle training regimen for women with stress urinary incontinence. Neurourol Urodyn. 2011 Jun; 30(5):746-53. doi: 10.1002/nau.21104. Review.
- Braekken IH, Majida M, Engh ME, Bø K. Morphological changes after pelvic floor muscle training measured by 3-dimensional ultrasonography: a randomized controlled trial. Obstet Gynecol. 2010 Feb; 115(2 Pt 1):317-24.
- Schrum A, Wolff S, van der Horst C, Kuhtz-Buschbeck JP. Motor cortical representation of the pelvic floor muscles. J Urol. 2011 Jul; 186(1):185-90.
- Moore et al. Adult Conservative management. Chapter 12. In: Incontinence. Eds: Paul Abrams, Linda Cardozo, Saad Khoury, Alan Wein. Paris, France, ICUD-EAU 2013
- Kearney R, Sawhney R, DeLancey JO. Levator ani muscle anatomy evaluated by origin-insertion pairs. Obstet Gynecol. 2004 Jul; 104(1):168-73.
- DeGroat WC, Yoshimura N. Anatomy and Physiology of the Lower Urinary Tract. In: Handbook of Clinical Neurology 3rd Series. Ed. Elsevier. Oxford, UK, 2015.
- Petros PE, Ulmsten U (1990) An Integral Theory of female urinary incontinence. Acta Obstet Gynecol Scand 69 (Suppl 153): 1-79.
- Petros PE, Swash M (2008) The Musculo-Elastic Theory of anorectal function and dysfunction. Pelviperineology 2008; 27: 89-93. <http://www.pelviperineology.org>
- Wallner C, Maas CP, Dabhoiwala NF, Lamers WH, DeRuiter MC. Innervation of the pelvic floor muscles: a reappraisal for the levator ani nerve. Obstet Gynecol. 2006 Sep; 108(3 Pt 1):529-34.

### **Bary Berghmans**

PFMT aims to restore the muscular strength, coordination and timing of contractions. Other parameters important in relation to the pelvic floor are timely relaxation, endurance, repeatability and fast feed forward loop contractions.

Timing might be one of the most important elements; in healthy continent women, activation of the PFM before or during physical exertion seems to be an automatic anatomic response, so an unconscious contraction. This PFM 'reflex' contraction is a fast feed-forward loop and might precede bladder pressure rise by 200-240 milliseconds, something that might have been lost in women with urinary incontinence. Also, it has been suggested that a well-timed, fast and strong pelvic floor muscles contraction may prevent urethral descent during intra-abdominal pressure rise.

To ensure an adequate sequence in pelvic floor muscle training the concept of the 4 Fs, i.e., Find-Feel-Force-Follow-through of pelvic floor muscles was introduced. Awareness (Find and Feel) of the different muscles involved in maintaining continence is necessary to be sure of avoidance of co-contractions of surrounding muscles (abdominals, buttocks, thighs and back) and activation of the relevant muscles. Sometimes, when patients find and use the relevant muscles at the appropriate time, symptoms can reduce at once.

Basic physiological muscle training principles teach us that pelvic floor muscle exercise programs must consist of selective MAXIMAL voluntary contractions with a repetitive character (Force) and sufficient time of relaxation between consecutive pelvic floor muscle contractions. Exercises can activate latent motor units to the point that the muscle becomes functional again, in stress urinary incontinence the indirect support of the bladder neck.

The principle of overload is based on stimulation of the muscle beyond its normal level of performance. Important parameters are quality (inward/upward movement of the pelvic floor muscles while maximal squeezing) and number of MAXIMAL conscious and unconscious contractions, number of contractions, duration of contractions and relaxation. For the training program also the number of series, number and duration of sessions and total training program are important.

The principle of selectivity or specificity refers to train a muscle in the way the muscle needs to be used. Exercises are adapted to slow-twitch fibers (endurance exercises) and fast-twitch fibres (strength and speed exercises).

Pelvic floor exercises should be practised in different starting positions; from lying, sitting to standing and resulting in as much as possible simulating everyday situations.

The principles Maintenance and Reversibility (follow-through) alert the patient to train regularly, sometimes lifelong, but the challenge for the pelvic physiotherapist is to incorporate functional training in such a way that patients will experience progress of their symptoms as soon as possible. Functional training of pelvic floor muscles means that the pelvic physiotherapist needs to mimic daily life activities and situations in which the patient used to experience incontinence and now – automatically – is capable to avoid this. In case of success, patients will be highly motivated to adhere to and continue their pelvic floor muscle training program.

## **Take home message**

Timing of active PFM contraction and relaxation may be the most important element of training

### **Alex Digesu**

The use of pelvic floor muscle training (PFMT) in the prevention and treatment of urinary incontinence, fecal incontinence and pelvic organ prolapse is based on two functions of the pelvic floor muscles, support of the pelvic organs and a contribution to the sphincteric closure mechanism of the urethra and anus.

PFMT can be used to reduce the prevalence of incontinence during pregnancy and up to 1 year after birth. Beyond this point, the little evidence available suggested that the effect did not persist.

There is very little evidence on the effectiveness of PFMT for prevention or treatment of fecal incontinence.

In conclusion based on the scientific literature it can be concluded that although it has been showed that PFMT is effective for prevention and for treatment of pelvic floor dysfunctions, there is still insufficient evidence to say whether or not PFMT is effective in the long term.

However several explanations can be given to justify this equivocal and confusing poor outcome of PFMT.

It could be hypothesized that the published data from RCTs have included either women have had more babies or they have stopped doing PFMT or that have poorly selected the right patients such as those with denervation in whom PFMT is unlikely to be effective.

Therefore larger and better designed RCTs are still needed before we draw any conclusion on the role of PFMT in the long term as treatment and prevention of pelvic floor dysfunctions.

Till then it is important that strategies are developed to encourage women to continue PFMT during and after every pregnancy, and indeed once their families are complete as well as during menopause.

### **Nucelio Lemos**

Pelvic floor muscle exercises have long been used to treat urinary incontinence and other symptoms, although its working mechanisms could only recently be understood, in the light of current anatomical knowledge brought up by frozen section techniques and functional pelvic floor muscle ultrasound and dynamic MRI.

In this lecture, detailed anatomy of the pelvic floor muscles and its relation to the endopelvic fascia will be reviewed, as well as the strength vectors produced by each pelvic floor muscle bundles contraction and relaxation, and its consequences.

Finally, a functional anatomy-based rationale will be developed on what kinds of symptoms would loosening or tone unbalances of each of these muscles would produce.

## **Take home message**

Pelvic floor muscles act by tensioning and loosening the pelvic floor fascias and ligaments, therefore producing strength vectors; any unbalances on these vectors can potentially produce voiding, storage or sexual symptoms.

### **Maura Seleme**

#### **How to improve adherence? Innovative strategies**

Pelvic Floor Muscle Training (PFMT) has been proven to be effective in treating female PFM dysfunctions such as stress-, urgency- or mixed urinary incontinence (UI), pelvic organ prolapse (POP) and lower bowel dysfunctions. Most studies support PFMT to cure UI or reduce UI incidence and severity. Motivation, compliance with a home maintenance program, and continuous adherence are key-factors for maintenance of PFMT results. Poor adherence is reported to be a main factor of declined effect on the long term. PFMT adherence is complex and necessitates patient's active behavioral change, motivation, discipline and participation. Stimulation of short-term adherence (in most cases PFMT is supervised) and long-term adherence (in most cases the patient continues training on her own at home, often after supervised therapy) need different strategies and planning. Up to now, relevant literature shows that 64% of patients adhere to PFMT and health advice short term, but only 23% long term. Thus, planning and implementing PFMT programs informed by adherence theory and evidence are potentially critical to achieving and maintaining (long-term) treatment effect. Exercise adherence has been identified as an important predictor of overall PFMT effectiveness and cost-effectiveness is dependent upon whether short-term outcomes can be maintained long term. Adherence and its determinants, from initial uptake to longer-term maintenance, need to be understood, measured, and harnessed to maximize PFMT effectiveness.

To maintain optimal training results, or cure from the pelvic floor dysfunction, it is obvious that the patient needs to train regularly, sometimes lifelong. But, the challenge for the pelvic physiotherapist is to incorporate functional training in such a way that patients will experience continuous progress, and really feel and understand that incorporation of PFM activity in daily life

activities during sport, at home or at work, in the beginning from conscious mono-tasking, later to double- and multi-tasking exercises, ending up with fully automatic functional activities is the way to long-lasting success.

This presentation will highlight and discuss issues related to evidence-based clinical practice of pelvic physiotherapy, how to improve adherence to training and, how to use innovative strategies to realize long-term effect of pelvic physiotherapy.

**Take home message**

No success of pelvic floor muscle training in treating pelvic floor dysfunctions in case patients do not adhere to their training. Challenge for the pelvic physiotherapist is to use functional training as a strategy to realize this

ICS 


Annual Meeting 2016  
Tokyo, Japan

**how to perform a pelvic floor muscle training and strategies for urinary incontinence?**

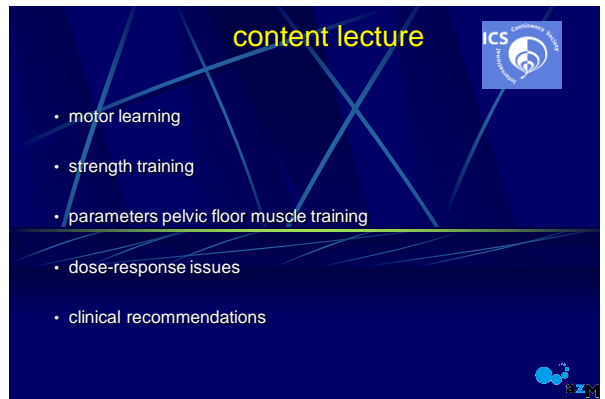
15 September 2016

Bary Berghmans PhD MSc RPT associate professor  
clinical epidemiologist, health scientist, pelvic physiotherapist  
Pelvic care Center Maastricht  
Maastricht University Medical Center  
The Netherlands



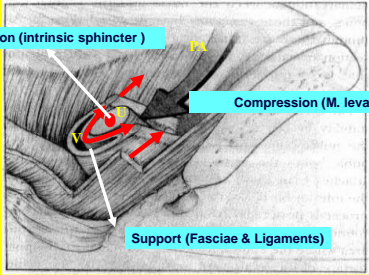
content lecture 

- motor learning
- strength training
- parameters pelvic floor muscle training
- dose-response issues
- clinical recommendations



structures of urethral support

PROPERTIES FEMALE URINARY SPHINCTER

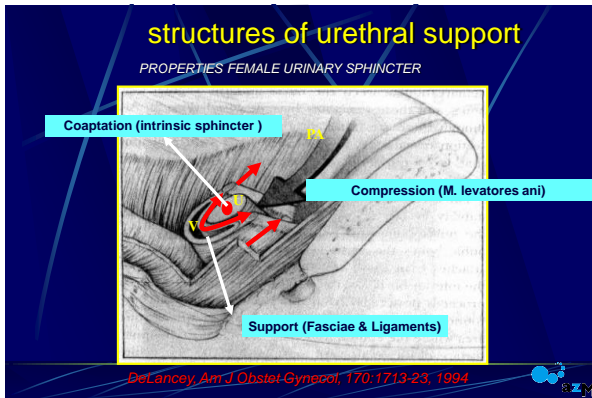


Coaptation (intrinsic sphincter)

Compression (M. levatores ani)

Support (Fasciae & Ligaments)

*DeLancey, Am J Obstet Gynecol, 170:1713-23, 1994*



key-word timing working mechanisms PT

conscious contraction before & during ↑ abdominal pressure & continuation contractions as behavior modification to prevent descent PF, the KNACK !!!

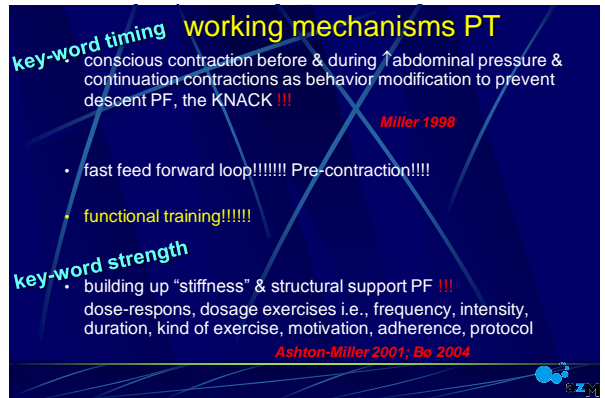
*Miller 1998*

- fast feed forward loop!!!!!! Pre-contraction!!!!
- functional training!!!!!!

key-word strength

- building up "stiffness" & structural support PF !!!
- dose-respons, dosage exercises i.e., frequency, intensity, duration, kind of exercise, motivation, adherence, protocol


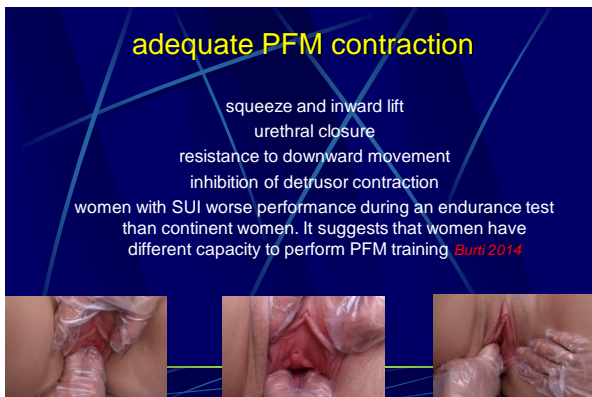
*Ashton-Miller 2001; Ba 2004*



adequate PFM contraction

squeeze and inward lift  
urethral closure  
resistance to downward movement  
inhibition of detrusor contraction

women with SUI worse performance during an endurance test than continent women. It suggests that women have different capacity to perform PFM training *Burt 2014*

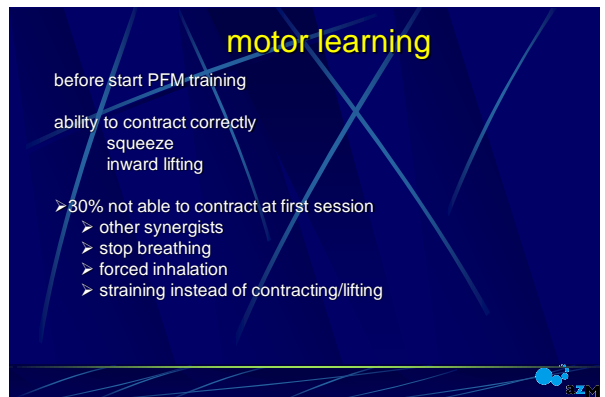



motor learning

before start PFM training

ability to contract correctly  
squeeze  
inward lifting

- 30% not able to contract at first session
  - other synergists
  - stop breathing
  - forced inhalation
  - straining instead of contracting/lifting



## motor learning

why correct PFM contraction difficult?

- hidden muscles
- unawareness of PFM contraction
- relatively small muscles
- awareness related to voiding/defecation, straining at toilet common

## motor learning

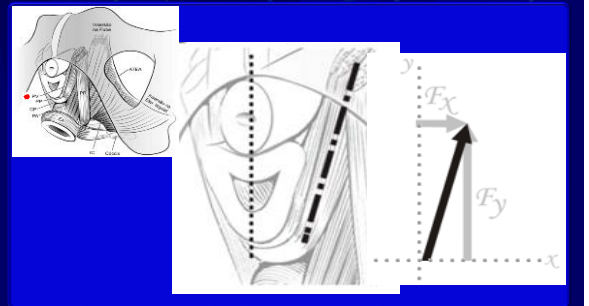
motor learning depends on sensory feedback *Tries 1990*

learning ↔ feedback → knowledge of results compensates for loss of internal feedback (after injury for instance because of vaginal delivery, helps in learning correct PFM contraction again)

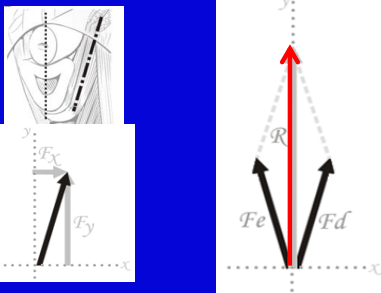
## motor learning

5 steps to learn correct PFM contraction

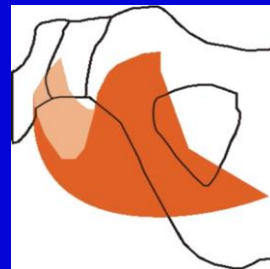
- understand (location, working mechanism)
- search (where to find)
- find (feedback PT)
- learn (performance of correct PFM contraction)
- control (recruiting as many motor units as possible)



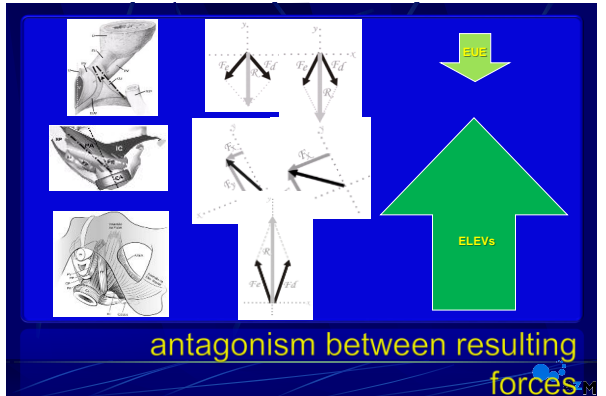
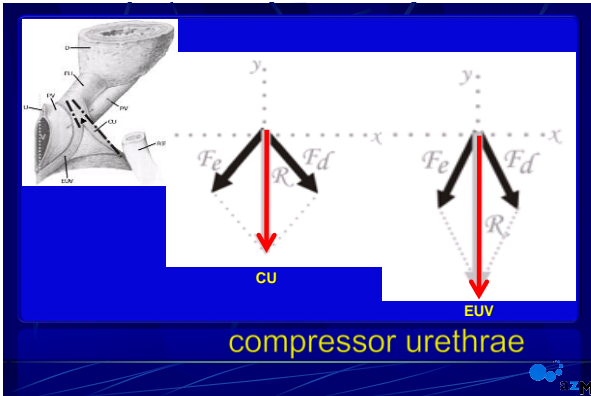
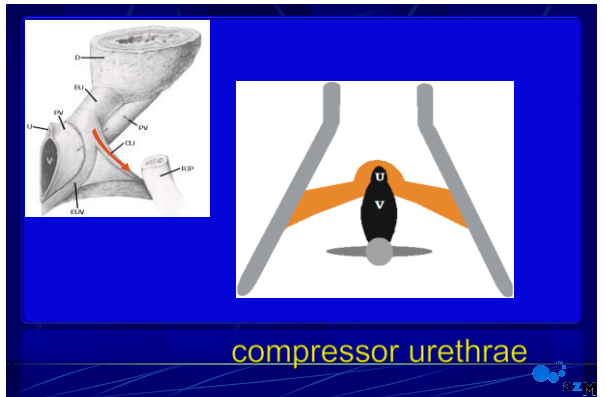
pubovaginal & puboperineal



pubovaginal & puboperineal



pubovaginal & puboperineal



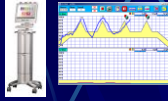


## how to teach this contraction

4 teaching tools to facilitate learning correct PFM contraction

- verbal instruction, indicating most important elements

- visual instruction



- direct contact PT (digital vaginal/rectal palpation)



- construction of daily activities

## motor learning

in patients with low awareness:

- demonstration PFM contraction in standing position, no movement pelvis or thighs visible outside
- patient palpation buttocks
- use metaphors ('closing the door') ('elevator=lifting') ('eating spaghetti') ('vacuum cleaner')

## strength training (ST)

objective ST:

change muscle morphology  
by

↑ cross-sectional area

↑ neurological factors by ↑ n activated motor neurons and frequency excitation

↑ muscle tone & stiffness

depends on  
type exercises, training programme, genetic & hereditary factors

## parameters PFMT

Female pelvic muscle functional assessment

Physiotherapist: \_\_\_\_\_  
 Patient name: \_\_\_\_\_  
 Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Number of Repetitions: 1 2

INSPECTION during resting		Yes	No	Not	Other
Perineal body	Visible	Yes	No	Not	Other
Contraction	Visible	Yes	No	Not	Other
Relaxation	Visible	Yes	No	Not	Other
Relaxation	Visible	Yes	No	Not	Other
Relaxation	Visible	Yes	No	Not	Other

INSPECTION postural assessment during coughing and pushing

Category	None	Minor	Moderate	Major
Leaning	Yes	No	No	No
Trunk flexion	Yes	No	No	No
Trunk extension	Yes	No	No	No

PALPATION postural

Site	None	Minor	Moderate	Major
Rectum	Yes	No	No	No
Vagina	Yes	No	No	No

PALPATION during resting

Category	None	Minor	Moderate	Major
Leaning	Yes	No	No	No
Trunk flexion	Yes	No	No	No
Trunk extension	Yes	No	No	No

Level of relaxation after conscious maximal contraction

Category	None	Minor	Moderate	Major
Leaning	Yes	No	No	No
Trunk flexion	Yes	No	No	No
Trunk extension	Yes	No	No	No

CONCLUSION condition after

Condition	Normal	Functional	Disorder	Interacting	Non functional
Condition	Yes	No	No	No	No

## consistency of program?

- all kinds of programs *Hay-Smith 2001, ICI 2013*
- **evidence based program > 11 RCTs prove!!!**
  - Individual PT program *Tsai 2009*
  - 8-12 VPFMC, 1-3 s, 6-8 s hold/relax
  - 3 x/day
  - home exercises daily
  - 45 min weekly classes for 6 mts *Bo 1990, Markved 2003, Bo 2004*

PFMT for UI grade B, for SUI grade A *ICI 2013*

PFMT + BF vs NT, OR 12.3, 95% CI 5.4-12.3 *Imamura 2010*

## strength training (ST)

- two loading strategies in PFM training *Bo 1990*

- moderate to high training loads → recruitment high-threshold fast twitch motor units for strength

BUT

contractions moderate to slow velocity

- light to moderate loads performed at explosive lifting velocity

- ask contractions as close to maximum as possible
- hold contraction
- add 3-4 fast contractions on top



## dose-response issues

- dose
  - mode of exercise: strength -, flexibility training, cardiovascular, PFM conduct in/upward, isometric, concentric, eccentric
  - frequency exercises: n training sessions/week, heavy loads > rest
  - intensity: strength training 60-65% of 1 RM young; 50-60% older
  - duration: 6 months intensive training; 15-20 weeks absolute minimum standard; training volume, variation, systematically altered

## dose-response issues

- response
  - adherence: extent to which the individual follows the exercise prescription, compliance

## muscle strength issues

- specificity: exactly PFM, not synergists, small increase abd pressure adequate stimulus for co-contraction → training effect; big increase not ok
- overload: progressive; sustain contraction, shorten rest periods between contractions, increase speed contraction, increase n contractions, frequency and duration work-outs, alternate form exercise, range to which PFM is being worked

## muscle strength issues

- variation
  - progression: continually increasing stress on PFM as capable producing ↑ force or endurance, very difficult in PFM (use of BF??) max/3-4 adds, lying to standing position, withdrawing intravaginal/-rectal device
  - maintenance: current level PFM fitness (cessation = detraining) Type II>I

## PFMT → mono/multi tasks

### objective

increasing skills & experience

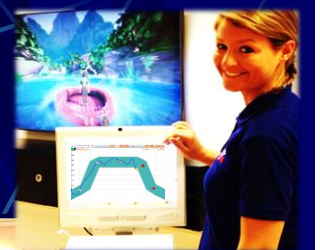
velocity/speed vs increasing maximal strength

fast feed forward loop = pre-contraction ≠ reaction

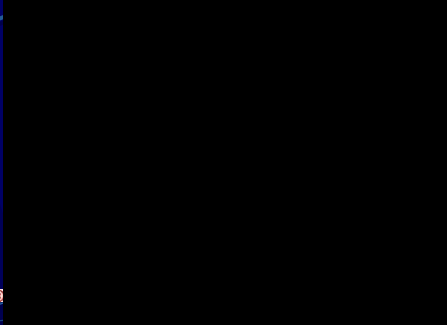
preparation for functional training

*Berghmans et al 2010*

## functional training



## wireless biofeedback



## new technology in functional training



## clinical recommendations

- make sure patient able to perform correct contraction
- contraction as 'hard' as possible
- progress with sustained contractions, higher velocity
- holding time 3-10 s
- PFMT every day towards **FUNCTIONAL TRAINING**
- encourage/motivate close to maximal contractions, verbal strong
- eccentric contractions
- information & education strength training develops in steps; largest progress in first period of training; after that train even harder!!!!



# Belief and disbelief related to evidence of PFME and training programs

**Alex Digesu MD, PhD**

St Mary's Hospital, Queen Charlotte's & Chelsea Hospital  
Imperial College Healthcare NHS Trust



A GOOD APOLOGY HAS THREE PARTS:

1. I'M SORRY
2. IT'S MY FAULT
3. WHAT CAN I DO TO MAKE IT RIGHT?

  
i know  
it's my fault  
and  
sorry  
about that

\*Urinary incontinence

- \*Prolonged defecation (over 5 mins)
- \*Excessive strain
- \*Incomplete emptying
- \*Abnormal frequency
- \*Incontinence
- \*Faecal Urgency
- \*Flatal incontinence

\*Urogenital Prolapse


## \*Signs and symptoms of dysfunction



\*Postnatal stress urinary incontinence is a common problem affecting up to 34% of women, while 3-5% have faecal incontinence.

Wilson PD 1996, MacArthur C 1997

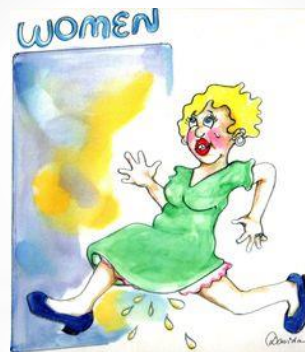
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If Physical Therapy for the pelvic floor (PF) is able to improve women pelvic floor dysfunction, should women train their PF all their life, if yes, how?

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**NICE** National Institute for Health and Care Excellence 

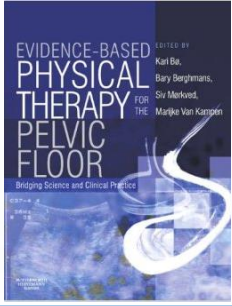
The National Institute of Clinical Excellence (NICE) and ICI **recommend** PFMT for all women in a first pregnancy for prevention of SUI based upon data from two RCTs.

Morkved S, Ba K, Schei B, Salvesen KA. Pelvic floor muscle training during pregnancy to prevent urinary incontinence: a single-blind randomized controlled trial. *Obstet Gynecol* 2003;101:13-19.

Reilly ET, Freeman BM, Waterfield MR, Waterfield AE, Steggle P, Pedlar F. Prevention of postpartum stress incontinence in primigravidae with increased bladder neck mobility: a randomised controlled trial of antenatal pelvic floor exercises. *BJOG* 2002;109:68-76.

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Cochrane Database Syst Rev. 2007;4:18(1):CD001407.

**WITHDRAWN: Pelvic floor muscle training for urinary incontinence in women.**

Hav-Sørensen E, Bak N, Benichou L, Hendriks HJ, de Bie RA, van Waas MA, van Doorn ES.

**AUTHORS' CONCLUSIONS:** Pelvic floor muscle training appeared to be an effective treatment for adult women with stress or mixed incontinence. Pelvic floor muscle training was better than no treatment or placebo treatments. The limitations of the evidence available mean that it is difficult to judge if pelvic floor muscle training was better or worse than other treatments. Most trials to date have studied the effect of treatment in younger, premenopausal women. The role of pelvic floor muscle training for women with urge incontinence alone remains unclear. Many of the trials were small with poor reporting of allocation concealment and masking of outcome assessors. In addition there was a lack of consistency in the choice and reporting of outcome measures that made data difficult to combine. Methodological problems limit the confidence that can be placed in the findings of the review. Further, large, high quality trials are necessary.

Update of Cochrane Database Syst Rev. 2001;(1):CD001407.

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**How long is a minute, depends on which side of the bathroom door you are on**

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**BJOG**

The long-term effectiveness of antenatal pelvic floor muscle training: eight-year follow up of a randomised controlled trial

WJ Agrest, P Steggle, M Waterfield, BM Freeman

*Obstetrics and Gynaecology* 2014; 116(1): 10-17

Accepted 21 March 2014



Treatment

- \* **Objective:** To determine the long-term effectiveness of antenatal pelvic floor muscle training (PFMT) on SUI
- \* **Design:** Eight-year follow up of a RCT
- \* The significant improvement in postnatal SUI shown in PFMT group compared with controls (19.2 vs 32.7%, P = 0.02) at 3 months was not evident 8 years later (35.4 vs 38.8%, P = 0.7)

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**BJOG**

The long-term effectiveness of antenatal pelvic floor muscle training: eight-year follow up of a randomised controlled trial

WJ Agrest, P Steggle, M Waterfield, BM Freeman

*Obstetrics and Gynaecology* 2014; 116(1): 10-17

Accepted 21 March 2014

**Conclusions:**

- \* The initially beneficial effect of supervised antenatal PFMT on SUI did not continue for a long term despite the majority claiming to still perform PFMT
- \* There was no difference in outcome between those who performed PFMT twice or more per week compared with those performing PFMT less frequently
- \* These findings are in keeping with those of other studies and raise concerns about the long-term efficacy of PFMT



Imperial College London Imperial College Healthcare NHS Trust

Neurology and Urology 33:269-276 (2014)

**Pelvic Floor Muscle Training for Prevention and Treatment of Urinary and Fecal Incontinence in Antenatal and Postnatal Women: A Short Version Cochrane Review**

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# Results

- Twenty-two trials involving 8,485 women.
- PFMT compared with or no PFMT for antenatal and postnatal women.
- The primary analysis investigated the prevalence of UI and fecal incontinence.


Boyle 2014



## Prevention of Incontinence

- Not enough evidence to say whether PFMT was effective in the prevention of urinary incontinence **in late pregnancy**
- PFMT women were about **50%** less likely to report urinary incontinence, compared to controls, in the **early postpartum period**
- PFMT women were still significantly less likely than controls to have urinary incontinence in the **mid postnatal period (3-6 months)**, although the difference in risk had reduced to **29%**

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## Comparison 1: Prevention of Incontinence


**5 YEARS**

- Two trials measured urinary incontinence at greater than 5 years (6 and 8 years, respectively).

**The earlier effectiveness of PFMT did not persist in the long term!**



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PFMT has a good short term efficacy on UI

The available evidence suggests a lack of long-term efficacy of peripartum PFMT


While further studies looking at the long term efficacy are needed, based on the available evidence, a critical reappraisal of PFMT may be needed



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**I can hardly contain my excrement.**

**ANAL INCONTINENCE**



**CONSTIPATION**



**Importance Of Kegel Exercises During Pregnancy**

**Biofeedback**

Stop straining  
Stronger squeeze  
Longer duration

**Electrical stimulation**

1.4.1  
**People who continue to have episodes of faecal incontinence after initial management should be considered for specialised management.**

This may involve referral to a specialist continence service, which may include:

- pelvic floor muscle training
- bowel retraining
- specialist dietary assessment and management
- biofeedback
- electrical stimulation
- rectal irrigation.

**\*Nice Guidelines Faecal Incontinence**  
Guideline 49 2007



**TREATMENT OF ANORECTAL DISORDERS WITH PELVIC FLOOR MUSCLE TRAINING (PFMT)**

- Theoretically, the external anal sphincter muscle (which is continuous with the puborectalis muscle component of the pelvic floor muscles) could be trained in a similar way to other pelvic floor muscle.
- Fewer studies of its **effectiveness** than for urinary incontinence.

Norton 2012

1. PFMT versus usual antenatal or postnatal care/ no PFMT for the **prevention** of incontinence.
2. PFMT versus usual antenatal or postnatal care / no PFMT for the **treatment** of incontinence.

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**AND**

**Pelvic Floor Muscle Training for Prevention and Treatment of Urinary and Fecal Incontinence in Antenatal and Postnatal Women: A Short Version Cochrane Review**

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## Results

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Boyle 2014



## Comparison 1: Prevention of Incontinence

**None of the seven trials reported data on the prevalence of postpartum fecal incontinence.**



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## Comparison 2: Treatment of Incontinence

**The prevalence of both UI and fecal incontinence at 1, 6 and 12 years was not statistically significant between the two groups.**



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**Electrical stimulation**



## Biofeedback

It utilizes electronically amplified recordings of pelvic floor muscle contraction to teach patients how to relax and contract the pelvic floor muscles.

### Biofeedback vs. electrostimulation in the treatment of postdelivery anal incontinence: a randomized, clinical trial (OASIS).



- 49 women who sustained third-degree or fourth-degree perineal rupture.
- Randomized to **biofeedback (19)** or **electrostimulation (21)** treatment.
- Biofeedback or electrostimulation sessions were performed two times daily for eight weeks in each group.
- **Neither biofeedback nor electrostimulation** treatments improved:
  - Wexner incontinence score
  - Reduced fecal incontinence QOL scores

Naimy 2007



**Randomised controlled trial comparing early home biofeedback physiotherapy with pelvic floor exercises for the treatment of third-degree tears (EBAPT Trial)**



- 120 women sustaining a third-degree tear.
- 30 to early postpartum home intra-anal biofeedback physiotherapy and 90 to PFEs alone (5mins twice daily for 3/12)

3 months post partum	EARLY BF	PFEs	PVALUE
Anal resting pressure	39 ± 13 mmHg	43 ± 17 mmHg	NS
Anal squeeze pressure	64 ± 17 mmHg	62 ± 23 mmHg	NS
Cleveland Clinic continence score	No difference	No difference	NS
Rockwood faecal incontinence QOL scores	No difference	No difference	NS

Peirce 2013



Cochrane Database of Systematic Reviews

**Biofeedback and/or sphincter exercises for the treatment of faecal incontinence in adults (Review)**

Norton C, Cody JD

**21 studies and 1525 patients**

**2012**

**Biofeedback – ES – PFMT**

1. Prevention (OASIS)
2. Treatment (FI)



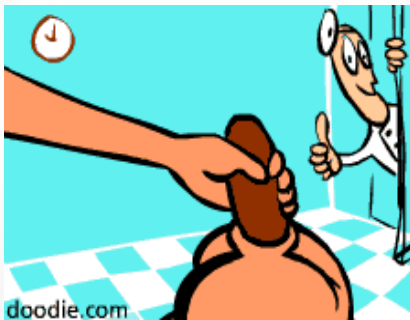
**Conclusions**

- No enough evidence to support the role** of anal sphincter exercises and biofeedback therapy in the management of faecal incontinence.

**BUT IF WE HAVE TO DO IT**

1. biofeedback plus exercises was better than exercises alone
2. biofeedback plus electrical stimulation was better than electrical stimulation alone
3. Exercises and electrical stimulation used in the anus may be more helpful than vaginal exercises or vaginal biofeedback for women with faecal incontinence after childbirth

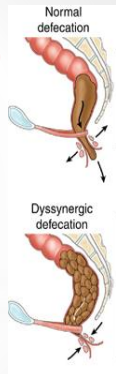
**Constipation**



**TWO MECHANISMS**

1. **Slow transit constipation**  
delayed movement of stool throughout the colon
2. **Pelvic floor dyssynergia**  
paradoxical contraction or failure to relax the pelvic floor during attempts to defecate.

Pelvic floor dyssynergia is believed to be responsible for up to 50% of constipation.



## Guidance for constipation

- \*Good fluid intake and dietary advice
- \*Regular bowel scheduling
- \*Medications (laxatives or diazepam)

## RIGHT

- Legs supported on the ground
- Trunk flexion over the abdomen
- Firm posture



Correct posture for emptying bowels

## Biofeedback

- When patients with pelvic floor dyssynergia do not respond to conservative interventions biofeedback is frequently recommended.
- Biofeedback utilizes electronically amplified recordings of pelvic floor muscle contraction to teach patients how to relax pelvic floor muscles and to strain more effectively when they defecate.

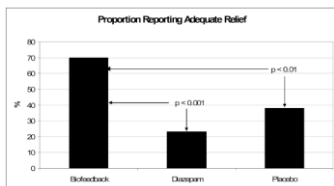
## Is Biofeedback effective?



*Dis Colon Rectum*. 2009 October ; 52(10) : . doi:10.1007/DCR.0b013c3181b55455.

### Randomized Controlled Trial Shows Biofeedback to be Superior to Alternative Treatments for Patients with Pelvic Floor Dyssynergia-type Constipation

Steve Heyman, MS<sup>1</sup>, Yolanda Scarlett, MD<sup>1</sup>, Kenneth Jones, PhD<sup>1</sup>, Yehuda Ringel, MD<sup>1</sup>, Douglas Drossman, MD<sup>1</sup>, and William E. Whitehead, PhD<sup>1</sup>  
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**Figure 3.** Primary Outcome Measure using a Chi Squared analysis comparing the proportion of subjects reporting adequate relief at 3-month follow-up in the biofeedback group compared to the diazepam and to the placebo groups.

WHAT YOU NEED TO KNOW?



## Take home messages



## Take home messages

1. PFMT started in **early pregnancy** is effective in reducing urinary incontinence in **late pregnancy** and up to **6 months** after delivery.
2. Not enough evidence to say whether or not PFMT was effective for the prevention of incontinence in the long term.

Incontinence			
	PFMT	No PFMT	pvalue
Reilly @ <b>6 years</b>	35.4%	38.8%	NS
Morkved @ <b>8 years</b>	23%	17%	NS

3. **No data on the prevention of FI**

## Take home messages



## Take home messages

- There is evidence that PFMT is effective to treat antenatal or postnatal urinary incontinence up to **1 year after delivery** regardless of whether PFMT was commenced in the antenatal or postnatal period.
- There was not a significant difference in the prevalence of urinary incontinence between the control and PFMT groups at **6 or 12 years postpartum**
- PFMT is not effective in the treatment of fecal incontinence at 12 months, 6 and 12 years after delivery.

Glazener 2001, Wilson 1998

## Persistence & adherence with PFMT

		PFMT
<b>Glazener 2001</b>	6 years	50%
		6% daily
	12 years	13%


1. Have women stopped exercising?
2. Subsequent pregnancies?



## CONCLUSIONS

- Pregnancy and birth appear to be the most consistent and important factors associated with the development of urinary and fecal incontinence in women.
- Therefore, all women who choose to have a child, or children, might be considered to be at risk of later incontinence.
- Some women (ie **connective tissue disorders, who are obese, or have forceps deliveries**) might be at even greater risk.
- Continent antenatal women benefit from more "intensive" PFMT programs (5-12 contacts) than the usual care that may incorporate some PFMT advice or teaching.

## \* QUESTIONS



**From Pelvic Floor Muscle Training to Funcional Training in Woman with Urinary Incontinence; Bottom Line Solution for Adherence**

**How to improve adherence?  
Innovative strategies**

**Practice of PFME**



*PhD PT Maura Seleme*

**Maura Seleme**  
Affiliations to disclose\*:

**No disclosure**

\* All financial ties (over the last year) that you may have with any business organization with respect to the subject mentioned during your presentation.

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**Milliseconds that can make you cry...**

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**Milliseconds can make you loose urine...**

Pre-contraction  
 200-240 milliseconds  
 Thind 1990, Thompson 2003

gatinho

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**g@thiv@**

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 10 minutos / 1000g  
 Para todos os tipos de musculatura

**g@thiv@**

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Treatment of Urinary Incontinence depends on precision, accuracy, knowledge, willpower, overcome barriers and gain milliseconds in muscle contraction

Pre-contraction  
 200-240 milliseconds  
 Thind 1990, Thompson 2003

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Passion

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**Public: Basic muscle functional assessment**

Patient/number: \_\_\_\_\_ Time: \_\_\_\_\_  
 Researcher: \_\_\_\_\_  
 Date: \_\_\_\_\_ Position: \_\_\_\_\_  
 Number of fingers: 1 2

<b>INSPECTION during resting</b>	Yes	No	Deny
Coloration	Yes	No	Deny
Contractility	Yes	No	Deny
Relaxation	Yes	No	Deny
Endurance	Yes	No	Deny
Strength	Yes	No	Deny

<b>INSPECTION postural assessment during coughing and pushing</b>	Yes	No	Deny
Coloration	Yes	No	Deny
Contractility	Yes	No	Deny
Relaxation	Yes	No	Deny
Endurance	Yes	No	Deny
Strength	Yes	No	Deny

<b>PALPATION in rest</b>	Yes	No	Deny
Coloration	Yes	No	Deny
Contractility	Yes	No	Deny
Relaxation	Yes	No	Deny
Endurance	Yes	No	Deny
Strength	Yes	No	Deny

<b>PALPATION during resting</b>	Yes	No	Deny
Coloration	Yes	No	Deny
Contractility	Yes	No	Deny
Relaxation	Yes	No	Deny
Endurance	Yes	No	Deny
Strength	Yes	No	Deny

<b>Level of relaxation after contraction maximal contraction</b>	Yes	No	Deny
Coloration	Yes	No	Deny
Contractility	Yes	No	Deny
Relaxation	Yes	No	Deny
Endurance	Yes	No	Deny
Strength	Yes	No	Deny

<b>CONCLUSION: muscle strength</b>	Yes	No	Deny
Coloration	Yes	No	Deny
Contractility	Yes	No	Deny
Relaxation	Yes	No	Deny
Endurance	Yes	No	Deny
Strength	Yes	No	Deny

**Guidelines on Stress Urinary Incontinence -Royal Dutch Society for Physiotherapy (KNGF) – 2011**

**g@thiv@**



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### Pelvic floor Muscle functional assessment

Patient(number) :  
 Researcher :  
 Date : Time:  
 Number of fingers r : 1 2 Position:

**INSPECTION during moving**

Inv.mov. visible	Yes	No	Desc.
Cocontraction	No	Yes	
Relaxation visible	RA/TA Good	Diaphragm Delayed	Adductors Incomplete
Relaxation visible	Yes		Gluteal Absent

**INSPECTION perineal movement during coughing and pushing**


Coughing	Inw	None	Desc.
- in case Inwards	before	during	after
Pushing	Desc	No	Inv.

*Guidelines on Stress Urinary Incontinence -Royal Dutch Society for Physiotherapy (KNGF) – 2011*

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### PALPATION in rest

Pain	No	Yes	R	L	A	P
VAS	0-100					



*Guidelines on Stress Urinary Incontinence -Royal Dutch Society for Physiotherapy (KNGF) – 2011*

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### PALPATION in rest

Pain	No	Yes	R	L	A	P
VAS	0-100					

**PALPATION during moving**

Conscious maximal contraction			
Urethral lift	Strong	Normal	Weak
Levators closing	Strong	Normal	Weak
Symmetric L/R	Yes	No	R > L
Level contraction	Strong	Normal	Weak

*Guidelines on Stress Urinary Incontinence -Royal Dutch Society for Physiotherapy (KNGF) – 2011*

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Endurance	≥10	9 - 7	6 - 4	3 - 1	0
Explosive strength	≥15	14 - 11	10 - 6	5 - 1	0
Level of relaxation after conscious maximal contraction					
	Complete <restlevel	Partly =restlevel	Incomplete >restlevel	Absent	
Delayed	Yes	No			


*Guidelines on Stress Urinary Incontinence -Royal Dutch Society for Physiotherapy (KNGF) – 2011*

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Level of relaxation after conscious maximal contraction				
	Complete <restlevel	Partly =restlevel	Incomplete >restlevel	Absent
Delayed	Yes	No		
Unconscious contraction during coughing and pushing				
Coughing				
Reflexcontraction	Yes	No		
Descent perineum	Absent	Weak	Modest	Strong
Uj	No	Coughing	Pushing	Yes
Flatus/FI	No	Coughing	Pushing	Yes
Pushing				
Relaxation	Yes	No	Paradoxal	

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CONCLUSION condition PFMF			
Overactive	Normal	Coordination disorder	underactive
			Non functional

*Guidelines on Stress Urinary Incontinence -Royal Dutch Society for Physiotherapy (KNGF) – 2011*

