Conservative Management of Female Stress Urinary Incontinence
Additional handout to be used in combination with main handout
Annual Symposium of the Argentine Urological Society
June 15, 2012 Buenos Aries Argentina
Dr Beth Shelly PT, DPT, WCS, BCB PMD

The role of the pelvic floor muscle (PFM) in continence

- Clinical experience in decreasing urinary incontinence (UI) with PFM training (Kegel 1948)
- Original framework of modern theories incorporate the role of the support ligaments and the PFM (Wall and DeLancey 1991, DeLancey 1993)
- Multiple basic science studies have now contributed to a more clear understanding of the role of the PFM in urinary continence (mechanism summarized well in Ashton- Miller 2007)
- After many well done RCTs and systematic reviews – evidence of decreased symptoms after PFM exercises
  - Comparing PFM training to no treatment (Dumoulin 2011)
  - Women who were treated were 17 times more likely to report cure or improvement
  - Were 5 to 16 times more likely to be continent on pad test
- "It is no longer a question of whether PFM training programs work but what components and combinations thereof are most effective" (Dumoulin 2011)

Conservative examination of PFM function (Bo 2005)

- Real time Imaging Ultrasound
  - Valid and reliable measurements
  - Very expensive for most therapy clinics
  - Measures PFM muscle thickness
  - Measures movement of urethra in response to PFM contraction and intra-abdominal pressure
- Dynamometry
  - Some reliability tests
  - Not clinically available
  - Measures closure pressure
  - Does not measure elevation
- Surface electromyography (EMG)
  - Good reliability, reproducibility, and significant clinical predictive validity
  - Measures electrical activity of PFM with vaginal or perianal sensors
  - Useful in identifying dyssynergia and overactive PFM
- Pressure biofeedback
  - Valid and reproducible
  - Measures PFM closure pressure
- Vaginal palpation

Rationale for the effect of PFM Training in SUI

- Close the urethra during abrupt increases in intra-abdominal pressure with a well-timed, quick and strong PFM contraction – Knack (Bo 2007)
- Increase PFM volume and shorten PFM length (Hoff Brækken 2010)
- Maintain urethral hiatus closed (Ashton-Miller 2007, Hoff Brækken 2010)
- A strong structural support (stiff pelvic floor) may prevent descent of the bladder neck and urethra and helps maintain urethral closure (Ashton-Miller 2007, Bo 2007)
- Elevate the resting position of the bladder and rectum (Hoff Brækken 2010)

Components of PFM Training

- Number of seconds contraction is held – 5 to 10 seconds (Schabrun 2011, Bo 1999)
- Amount of rest between contractions – 5 to 10 seconds, adequate rest is necessary for successful training (Schabrun 2011)
- Number of repetitions – gradually increase, at least 24 contractions per day according to a meta-analysis (Choi 2007)
- Number of times repeated during the day – 2 to 3 sets per day especially if the muscle is very weak
- Patient position - Supine, sitting, standing
    - Randomized study comparing supine-only PFM exercises to supine and upright PFM exercises showed no significant difference in decreasing UI (Borello-France 2006)
- Overflow /facilitation – adductors, abductors, external rotators
    - Very weak muscles may need assistive exercises initially
    - Most practitioners will advance exercises to be performed in an isolated manor
    - Some clinical and small research evidence shows that overflow exercises can be as successful as isolated exercises (Dumoulin 2011, Culligan 2010)
- Intensity
    - Submaximal exercise can help isolate PFM contraction for better quality and coordination and can result in decreased UI (Johnson 2001)
    - Maximal intensity exercises are needed for full strengthening (Bo 1999)
- Resistive exercises
    - Some practitioners feel exercise done in upright (sitting or standing) provide gravity resistance and are more difficult
    - Vaginal weights – can result in decreased UI (Herbison 2008) but comparison studies do not chow a significant advantage over PFM exercises alone (Bo 1999)
- Functional training
    - Functional training (during increased intra-abdominal pressure): 98% decrease in UI with moderate cough if "the knack" was taught (Miller 1998)
    - Bladder neck elevation occurred consistently only during PFM and Tranversus Abdominus contraction (Junginger 2010)
    - Teach PFM contraction during lifting and pushing

- Breathing
  - PFM contraction should be trained on the exhale for better trunk stability and bladder neck elevation during coughing and sneezing (Miller 1998)
  - Breathe during PFM endurance contraction as PFM activity can be maintained regardless of breathing phase (Hodges 2007)
  - Bearing causes downward movement of urethra and an inability to maintain PFM contraction / elevation (Junginger 2010)
- Frequency of visits - Supervised PFM training more than 2 times per month are more effective (Dumoulin 2011)
- Group versus intensive training
  - "Intensive PFM training" (individualized instruction with repeated visits) appears better than "group PFM training" (exercise class) (Hay-Smith 2004)
  - Individualized PFM training and bladder training vs. group exercises - improvement rates of 94% vs. 86% (Janssen 2005)
  - Significant decrease in UI in patients exercising in a group with a PT compared to those in home training. Based on individual teaching of correct PFM contraction and close supervision (Bo 1990)
  - Group compared to individual – participants undergoing individual training were dryer on pad test but otherwise both group had improvement in strength, quality of life and patient satisfaction (86% in both groups). Group PFM exercises is significantly better than no treatment. (Pereira 2011)
- Adherence
  - Upcoming results from the ICS Physiotherapy adherence subcommittee
  - Those using a routine approach to PFMT adherence and practicing bladder training where 12 x more likely to maintain adherence (Dumoulin 2011)
  - Those using audiotaped instructions were more likely to perform exercises 2x / day. (Dumoulin 2011)
  - Studies on long-term effects of PFM training found that adherence was a significant predictor of success both during the period of therapy and thereafter (Alewijnse 2007)
- Length of training period
  - First 6 to 8 weeks is neural adaptation, increased coordination; will see decrease in UI (Burns 1993; Dougherty 1993; Wyman 1998)
  - Muscle hypertrophy begins after regular and intense strength training for more than 8 weeks (Dinubile 1991)
  - Meta-analysis of PFM training shows program must last for at least 6 weeks (Choi 2007)

Maintenance
  - No standard agreement, may be individual for each patient
  - One set of 8-12 intense contractions 2 to 7 times per week (Pollock 1998, Hayn 2000)

References

Alewijnse D, Mesters I, Metsemakers JFM, van den Borne B. Strategies to enhance adherence and reduce drop out in conservative treatment. In: Bo K, Berghmans B, Morkved S, Van Kampen M, eds. Evidence-Based Physical Therapy for the Pelvic Floor: Bridging Science and Clinical Practice. Philadelphia: Elsevier; 2007.

Ashton- Miller JA, DeLancey JOL. Functional anatomy of the female pelvic floor. Chapter 3 in Evidence-based physical therapy for the pelvic floor. Eds Bo K, Berghmans B, Morkved S, Van Kampen M. Elsevier Edinburg. 2007.

Bo K, Talseth T, Holme I. Single blind, randomised controlled trial of pelvic floor exercises, electrical stimulation, vaginal cones, and no treatment in management of genuine stress incontinence in women BMJ 1999;318:487–93.

Bo K, et al. Pelvic floor muscle exercise for the treatment of female stress urinary incontinence, 3: effect of two different degrees of pelvic floor muscle exercises. Neurourol and Urodynam 1990;9:489-502.

Bo K. Pelvic floor muscle training. In: Evidence-based Physical Therapy for the Pelvic Floor. Bo K, Berghmans B, Morkved S, Kampen MV (eds.). Philadelphia: Elsevier, 2007.

Bo K, Sherburn M. Evaluation of female pelvic floor muscle function and strength. *Phys Ther.* 2005;85:269-282.

Borello-France DF, Zycynski HM, Downey PA, Rause CR, Wister JA. Effect of pelvic-floor muscle exercise position on continence and quality-of-life outcomes in women with stress urinary incontinence. *Phys Ther*. 2006;86:974-986

Burns PA, et al. A comparison of effectiveness of biofeedback and pelvic muscle exercise treatment of stress incontinence in older community-dwelling women. *J Gerontol*. 1993;48:M167-M174.

Choi H, Palmer MH, Park J. Meta-analysis of pelvic floor training: randomized controlled trials in incontinent women. *Nursing Research*. 2007; 56: 226-234.

Culligan PJ, Scherer J, Dyer K, Priestley JL, Guingon-White G, Delvecchio D, Vangeli M. A randomized clinical trial comparing Pelvic Floor Muscle training to a Pilates exercise program for improving pelvic muscle strength Int Urogynecol J 2010;21:401-408.

DeLancey JOL. Anatomy and biomechanics of genital prolapse. Clinical Obstetrics and Gynecology 1993;36(4):897-909.

Dinubile N. Strength Training. *Clinic in Sports Medicine*. 1991; 10: 33-62.

Dougherty M, Bishop K, Mooney R, et al. Graded pelvic exercises: effect on stress urinary incontinence. *J Reprod Med*. 1993;38:684-691.

Dumoulin C, Glazner C, Jenkinson D. Determining the optimal pelvic floor training regimen for women with stress urinary incontinence. Neurourol and Urodynam 2011;30:746-753.

Hay-Smith EJ, et al. Pelvic floor muscle training for urinary incontinence in women. *Cochrane Database Syst Rev.* 2004;1:CD001407

Herbison, P; Dean, N. Weighted vaginal cones for urinary incontinence. *The Cochrane Review Library.* Cochrane Database of Systematic Reviews. 2, 2008.

Hodges PW, Sapsford R, Pengel LHM. Postural and respiratory functions of the pelvic floor muscles. *Neurourol and Urodynam*. 2007;26(3):62-371.

Hoff Brækken I, Majida M, Ellström Engh MM, Bo K. Morphological Changes After Pelvic Floor Muscle Training Measured by 3-Dimensional Ultrasonography A Randomized Controlled Trial. Obstet Gynecol 2010;115:317–24.

Hayn MA, Gresco SJ, Capuano K, Byrnes A. Compliance with pelvic floor exercise program: maintaining bladder symptom relief. *Urol Nurs*. 2002;20:129-131.

Janssen CC, Lagro-Janssen AL, Felling AJ. The effects of physiotherapy for female urinary incontinence: individual compared with group treatment. BJU Int. 2001;87:201-6

Johnson VY. Effect of a submaximal exercise protocol to recondition the pelvic floor musculature. Nurs Res 2001;50:33-41.

Junginger B, Baessler K, Spasford R, Hodges PW: Effect of abdominal and pelvic floor tasks on muscle activity, abdominal pressure and bladder neck. Int Urogynecol J. 2010; 21: 69-77.

Kegel A. Progressive resistance exercises in functional restoration of perineal muscle4. Am J Obstet and Gyencol 1948;56:238-248.

Miller JM, Ashton-Miller JA, Delancey JO. A pelvic muscle precontraction can reduce cough-related urine loss in selected women with mild SUI. *J Am Geriatr Soc.* 1998;46:870-874

Pereira VS, Correia GN, Driusso P. Individual and group pelvic floor muscle training versus no treatment in female stress urinary incontinence: a randomized controlled pilot study. Eur J Obstet Gynecol Reprod Biol. 2011 Dec;159(2):465-71. Epub 2011 Oct 1.

Pollock ML, Gaesser GA, Butcher JD, et al. The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness and flexibility in healthy adults. *Med Sci Sports Exerc*. 1998; 30:975-991.

Schabrun SM, Stafford RE, Hodges PW. Anal sphincter fatigue: is the mechanism peripheral or central? Neurourol and Urodynam 2011;30:1550-1556.

Wall L, DeLancey J The politics of prolapse: a revisionist approach to disorders of the pelvic floor in women. Perspectives of Biological Medicine 1991;34(4):486-496.

Wyman JF, et al. Comparative efficacy of behavioral interventions in the management of female urinary incontinence. *Am J Obstet Gynecol*. 1998;179:999-1007

www.bethshelly.com
beth@bethshelly.com