CE

Identifying Urinary Incontinence in the Home Setting

Part 2: Treatment and Related Care of Incontinence

Sarah Teel, DPT

This is Part 2 of a 2-part series for treating urinary incontinence in the home care setting. Part 1 addresses the assessment, diagnosis, and strategies in the treatment of urinary incontinence; including a case study.

Pelvic Floor Strengthening/ Rehabilitation

Dr. Arnold Kegel originally defined pelvic floor strengthening as a physiological training or "tightening up" the pelvic floor (Kegel, 1948). Modern exercise science provides an excellent foundation for understanding pelvic floor muscle (PFM) training in the context of strength training (Bo, 2004). Strengthening of the PFMs as well as the coordination of these muscles is essential in the rehabilitation process for the treatment of urinary incontinence (UI). Having adequate strength is necessary, but learning coordination during a contraction of the PFMs with functional movements is equally important. The rationale for the effect of PFM training is well supported in the literature.

Bladder training is a behavioral modification technique that is used to treat UI by placing a patient on a voiding schedule. Refer to Table 1 for bladder training information. Systematic review of 96 randomized controlled trials and 3 systematic reviews from 1990 to 2007 concluded that PFM training combined with bladder training effectively resolved UI in women, as compared with drug therapy, electrostimulation, medical devices, injectable bulking agents, and local estrogen therapy (Shamliyan et al., 2008). According to the U.S. Department of Health and Human Services, Public Health Service, and the Agency for Health Care Policy and Research, good candidates for bladder training are ambulatory, mentally active, and motivated (Fantyl et al., 1996). Poor candidates include those who are cognitively impaired, or have a severe physical impairment, a urinary infection, or a urinary fistula (Fantyl et al., 1996). In addition, indwelling catheters are a contraindication for PFM training (Fantyl et al., 1996).

The goals of bladder training are to improve control of bladder urgency, correct inappropriate habits of frequent urination, extend intervals between voids, increase bladder capacity, reduce incontinence episodes, and build self-confidence in having better bladder control (Paraiso & Abate, 2006).

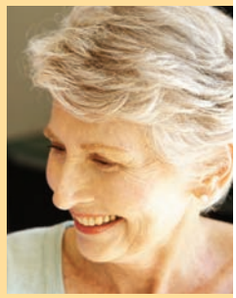
Improvement in the timing and coordination of voluntary contraction of the PFM before increases in intra-abdominal pressure decreases incontinence (Bo, 2007). This method of improving the coordination of the PFMs prior to functional movements using the abdominal muscles is important for controlling UI, specifically for stress UI. The greater the fascial laxity of the pelvis, the greater the strength needed by the PFMs to stabilize (Sapsford, 2004). The key to training the PFMs to decrease stress UI is to focus on a strong, well-timed, and quick contraction of the PFM prior to increases in intra-abdominal pressure such as occurs when sneezing, coughing, laughing, or lifting and exertion (Bo, 2007). This closes the urethra and structurally prevents descent of the bladder neck and urethra thereby preventing UI (Bo, 2007). For example, with sneezing, laughing,

Table 1. Bladder Training

Purpose of bladder training	Increase time in between voiding gradually to achieve more normal voiding schedule. Bladder training is used for those with urge UI or OAB
Prior to setting up bladder training	Assess current voiding schedule and frequency from voiding diary
Behavioral modification techniques of bladder training	Set up a timed toileting schedule based on current voiding schedule
Examples	Void first thing on waking in the morning
	If patient is voiding each 60 min, have him or her gradually increase that to each 75 min
	Once success is achieved at this voiding schedule again, increase by 15 min
Helpful hints	Encourage patient to distract himself or herself or sit down to make the increase in time intervals
	Have patient go to the bathroom even if he or she thinks he or she do not have to go during the timed voiding schedule
	Minimize bladder irritants
	Do not get discouraged by accidents, write any leakage episodes down
	Do not go to the toilet "just in case"

Notes: OAB = overactive bladder; UI = urinary incontinence.

Pharmacological therapy is often used in conjunction with behavioral modifications for the treatment of urge urinary incontinence. Anticholinergic/antimuscarinic agents are most commonly used, and are recommended as the first line for pharmacological therapy by the Agency for Health Care Policy and Research. These medications focus on detrusor overactivity.



coughing, or jumping, there is a significant increase in intra-abdominal pressure with a potential strong contraction of the abdominal muscles. This increase in pressure directly puts pressure down onto the bladder. If the PFMs are not already contracted before this increase in intra-abdominal pressure, leakage of urine will occur.

In urge UI, PFM contraction causes inhibition of the detrusor muscle (Bo, 2007). PFM training causes morphologic and neuromuscular changes that may reduce the neuromuscular activity that causes the involuntary and frequent urethral pressure fluctuations (Bo, 2007). Essentially, if the PFMs are strong and adequate, with a contraction, they inhibit the detrusor muscle contraction, which is squeezing the urine out of the bladder. See Figure 1 for an anatomical picture of this concept.

PFM training is a program of repeated PFM contractions taught by a healthcare professional (Wilson et al., 2002). Training implies repeated exercise over time; exercise refers to one episode of training (Wilson et al., 2002). PFM contraction should be specific. When training PFMs, isolated movements of just the pelvic floor should occur and no other movements of the pelvis or other muscles should be visible. A meta-analysis of PFM training by Choi et al. (2007) suggests that most clinical trials do not describe precisely all parameters of the training, such as the number, frequency, velocity of contractions, length of training period, and type of instruction provided. However, it was concluded that as long as the training included at least 24 daily contractions and lasted for at least 6 weeks, it was successful for treating UI (Choi et al., 2007). This lower number of only 24 contractions per day may help to increase patient compliance with adherence to pelvic floor training.

Treatment Options

Pelvic Floor Exercises

It is important to incorporate pelvic floor strengthening, neuromuscular coordination, and exercises into the patient's activities of daily living. It is important to assess correct technique of the exercises is performed to ensure that patients are not holding their breath, which increases intra-abdominal pressure, bearing down and pushing out of the PFMs. If the patient has significant weakness of the PFMs (Grade 0–2, Table 2), exercise should begin with isolating to the PFMs and not compensating by using the gluteals or abdominals excessively. It is an ideal goal that patients hold the contraction of the PFMs to a maximum capacity while increasing the length of the contraction. The research of Arab and Chehrehrazi (2011) states that there is a coactivation of the transverse abdominis and the internal oblique with PFM contraction. This research also shows there is no change in thickness of the muscle contraction of the transverse abdominis and internal oblique in response to a PFM contraction in women with or without stress UI (Arab & Chehrehrazi, 2011). It is important to establish that normal contraction of the PFM also causes a cocontraction of the abdominals. The concept of exercise training should incorporate the pelvic floor contractions with abdominal contractions. Coordination of proper breathing to prevent Valsalva maneuver is essential in exercise training to improve UI. In a Valsalva maneuver, activation of other abdominal musculature such as the internal obliques and rectus abdominis may occur, thereby increasing

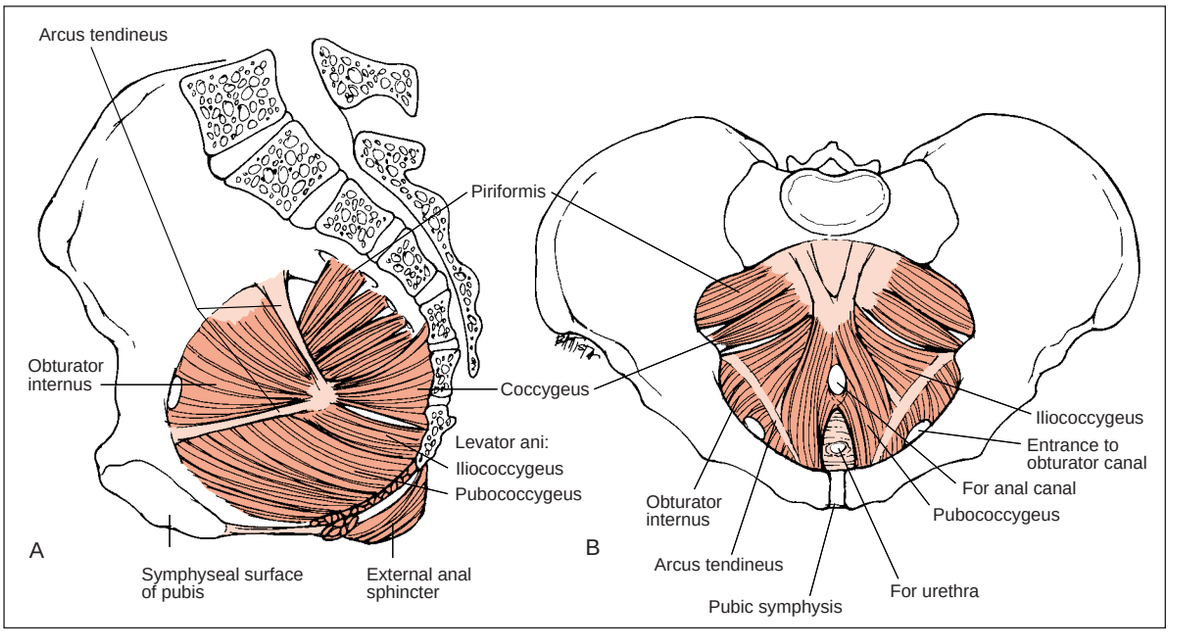


Figure 1. Anatomical concept of detrusor and pelvic floor muscle.
Source: From Oatis, Carol A: *Kinesiology: The Mechanics and Pathomechanics of Human Movement.* Baltimore, MD: Lippincott Williams & Wilkins 2004.

intra-abdominal pressure. The progression of exercises should be planned toward a functional purpose, starting with moving from supine to sitting, to standing, to a partial squat, then to feet apart in standing, and finally with gait and weight shifting activities in standing. Movements can be incorporated for functional transfers, such as a log roll for getting out of bed to avoid leaking, or from supine to sitting and then sitting to supine.

Biofeedback

Biofeedback is a process that enables an individual to learn how to change physiological activity for the purposes of improving health and performance. Precise instruments measure physiological activity such as brainwaves, heart function, breathing, muscle activity, and skin temperature (Biofeedback Certification International Alliance, 2008). The use of biofeedback in the literature is highly supported as a successful intervention in the treatment of UI. Biofeedback is not a treatment, but rather an adjunct to treatment (Bo, 2007). Biofeedback allows the patient to visualize and increase proprioceptive input of what the PFMs are doing. It can motivate and enhance the patient's effort during training (Bo, 2007). Biofeedback training sessions for the pelvic floor usually involve using devices such as a surface electromyography (EMG) or real-time ultrasound.

Types of Biofeedback

- Simple biofeedback does not require specialized equipment. It can be as easy as the healthcare practitioner using a hand mirror so the patient can visually see the perineum move during an active PFM contraction. The patient can also achieve simple biofeedback by palpating the area around anus or vagina externally during a contraction to feel the contraction. This can be done on the skin, undergarments, or sometimes through clothes if feasible. The patient can also palpate the contraction internally as well through the vagina, if flexibility and mobility allow for this.
- Pressure biofeedback involves the insertion of a device internally. There are many variations of this type of equipment. Home trainer pressure biofeedback devices can be good for patients who need motivation to complete and adhere to exercises, or to those who will need the device for an extended period of time. Contraindications to the use of pressure biofeedback devices

mostly applicable to the home healthcare setting include atrophic vaginitis, vaginal pain upon insertion of the probe, active vaginal infections, and immediately postsurgical or postpartum (6 weeks).

- EMG biofeedback is a surface EMG that records the bioelectrical activity generated by muscle fibers. The surface electrodes are placed around the PFMs, or an internal vaginal or rectal sensor can be used. A dual-channel system also offers a surface electrode to be placed on the abdominals or other muscle groups to monitor activity. EMG biofeedback requires increased equipment for the home healthcare practitioner to use during treatment, such as the biofeedback unit and sometimes the use of a laptop to visualize the biofeedback session, as well as to store and record the information to compare treatment to treatment.
- Real-time transabdominal ultrasound can be used as a biofeedback method. It is the most recent clinical tool used to assess and visualize the PFM contraction as well as the transverse abdominis. Transabdominal application of diagnostic ultrasound is a personally noninvasive method for imaging and assessing PFM activity and is both valid and reliable (Sherburn et al., 2005). This device is more costly than EMG biofeedback and not readily available to many clinicians, especially in the home healthcare setting.

Table 2. Laycock 2008 PERFECT Grading Scale

Laycock 2008 MMT	
0	No contraction
1	Flicker of muscle detected
2	Weak squeeze, no lift
3	Fair squeeze with definite lift (grade 3–5 are generally discernible on visual perineal inspection)
4	Good squeeze, good lift, able to hold against resistance, repeatable hold and lift
5	Strong squeeze, against strong resistance, repeatable squeeze and lift
Laycock PERFECT Scale	
Power	Test of voluntary muscle contraction; see grading chart above
Endurance	Hold time: the time (up to 10 s) a max voluntary contraction can be held before a reduction in power of 50% is detected
Repetitions	Number of repetitions (up to 10) of the max voluntary contraction
Fast Twitch	Quick contractions: number of 1 s contractions that can be performed in 10 s
Elevation	Lifting of the posterior vaginal wall toward the pubic bone and cephelad: present or absent
Cocontraction	Proper cocontraction of the deep abdominal muscles; oresent or absent
Timing	Intake involuntary PFM contraction. Present or absent.

Notes: MMT = Manual Muscle Test; PFM = pelvic floor muscle.
Source: Data from Laycock and Haslem, 2008.

Pharmacological Interventions

Pharmacological therapy is often used in conjunction with behavioral modifications for the treatment of urge UI. Anticholinergic/antimuscarinic agents are most commonly used, and are recommended as the first line for pharmacological therapy by the Agency for Health Care Policy and Research (Biller & Davila, 2006). These medications focus on detrusor overactivity. However, they have many side effects including blurred vision, dry mouth, dry eyes, tachycardia, palpitations, constipation, cognitive dysfunctions, nausea, vomiting, headache, and drowsiness. More than 70% of patients do not continue this therapy beyond 9 months secondary to the side effects (Rudy et al., 2006). Some research suggests that behavioral training is more effective than medications in an 8-week trial (Johnson et al., 2005). See Table 3 for a complete list of medications used to treat urge UI and their most common adverse effects.

Other medications not specific to the treatment of UI may also affect it. Abrams et al. (2005) described many other medications that can effect incontinence management. Sedatives may cause confusion as well as sedation and

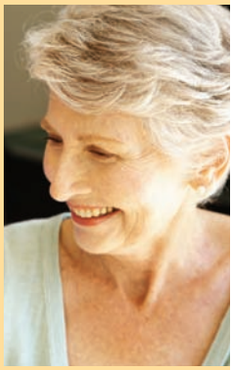
Table 3. Medication Table for the Treatment of Urge Urinary Incontinence

Generic Name	Brand Name	Action	Adverse Effects	Contraindications
Oxybutynin chloride	Ditropan XL, Oxytrol (transdermal patch)	Act mainly during storage phase: block muscarinic acetylcholine receptors, inhibiting detrusor muscle contraction and bladder emptying	Dizziness, drowsiness, blurred vision, dry mouth, urine retention	Glaucoma, urinary retention, obstructive GU or GI disease, unstable cardiovascular status, myasthenia gravis
Chloride	Detrol LA	Act mainly during storage phase: block muscarinic acetylcholine receptors, inhibiting detrusor muscle contraction and bladder emptying	Dizziness, drowsiness, blurred vision, dry mouth, urine retention	Urinary retention, or gastric retention, uncontrolled glaucoma, hepatic or renal dysfunction
Propantheline bromide	Pro-Banthine	Adjunctive therapy in peptic ulcer disease, unapproved in adult treatment for urinary bladder spasms	Constipation, dry mucous membranes	
Trospium chloride	Sanctura	Act mainly during storage phase: block muscarinic acetylcholine receptors, inhibiting detrusor muscle contraction and bladder emptying	Heat stroke caused by increased sweating	Uncontrolled narrow-angle glaucoma, urinary retention, gastroparesis
Darifenacin	Enablex	Act mainly during storage phase: block muscarinic acetylcholine receptors, inhibiting detrusor muscle contraction and bladder emptying		Uncontrolled narrow-angle glaucoma, urinary retention, gastric retention, severe hepatic impairment
Solifenacin succinate	Vesicare	Act mainly during storage phase: block muscarinic acetylcholine receptors, inhibiting detrusor muscle contraction and bladder emptying	Hallucinations	Uncontrolled narrow-angle glaucoma, urinary retention, gastric retention, severe hepatic impairment
Fesoterodine	Toviaz	Act mainly during storage phase: block muscarinic acetylcholine receptors, inhibiting detrusor muscle contraction and bladder emptying		Uncontrolled narrow-angle glaucoma, urinary retention, gastric retention
Amitriptyline	Elavil	Depression; during storage phase: block muscarinic acetylcholine receptors, inhibiting detrusor muscle contraction and bladder emptying	Blurred vision, dry mouth, dry eyes, tachycardia, palpitations, constipations, cognitive dysfunctions, nausea and vomiting, headache, drowsiness	

Notes: GI, gastrointestinal; GU, genitourinary.
Source: Data from Hamilton, 2011.

difficulty ambulating. This may impact the patient negatively when trying to get to the bathroom in time to void. Alpha-adrenergic antagonists, such as albuterol, and other asthma medications cause a decrease in smooth muscle tone in the urethra, increasing stress incontinence (Abrams et al., 2005). Alpha-adrenergic agonists, such as Sudafed, can increase the

The key to training the pelvic floor muscles to decrease stress urinary incontinence (UI) is to focus on a strong, well-timed and quick contraction of the pelvic floor muscle prior to increases in intra-abdominal pressure such as occurs when sneezing, coughing, laughing, or lifting and exertion. This closes the urethra and structurally prevents descent of the bladder neck and urethra thereby preventing UI. For example, with sneezing, laughing, coughing, or jumping there is a significant increase in intra-abdominal pressure with a potential strong contraction of the abdominal muscles. This increase in pressure directly puts pressure down onto the bladder.



bladder resistance causing urinary retention, weak stream, and leaking (Abrams et al., 2005). Diuretics, such as furosemide, increase voiding frequency (Abrams et al., 2005). Antihistamines and antidepressants cause urinary retention from increased bladder outlet tension causing increased frequency, weak stream, and leaking (Abrams et al., 2005).

Opioid analgesics such as codeine, morphine, Oxycodone, and Vicodin cause constipation, which increases UI and urinary retention (Abrams et al., 2005). Calcium channel blockers such as Cardizem, Cardene, Covera, and Dilacor can cause urinary retention, constipation, and edema with increased nighttime urine production (Abrams et al., 2005).

The Therapist's Role in UI

Some therapists specialize in the treatment of UI. For physical therapists, this can include specialized training through the American Physical Therapy Association (APTA) Section on Women's Health (Section on Women's Health, 2011). Other continuing educational companies offer specialized training and certification programs such as the Herman & Wallace Pelvic Rehabilitation Institute (2012).

Practical/Clinical Implications

The treatment of UI needs to be addressed in the home healthcare setting. The majority of the home healthcare patient population are older adults, and UI is most prevalent in this population. Medicare is the primary insurance basis in the home healthcare setting and needs to be considered in the comprehensive assessment for the patient with UI. OASIS-C is a modification to the Outcome and Assessment Information Set (OASIS) that home health agencies must collect in order to participate in the Medicare program (Centers for Medicare and Medicaid Services [CMS], 2012). The OASIS-C data item M1610 indicates if the patient has UI or urinary catheter presence (CMS, 2012). If the patient has UI then mark response 1. OASIS M1615 data item asks when does the UI occur (0 = timed voiding defers incontinence, 1 = occasional stress incontinence, 2 = during the night only, 3 = during the day only, 4 = during the night and day)? (CMS, 2012). When incontinence is identified, it should be treated with some of the previously discussed techniques by a home healthcare nurse, or by a physical therapist or occupational therapist trained specifically in pelvic floor dysfunctions. If functional incontinence is also part of the findings, then physical and occupational therapist should be involved in the care planning and treatment of the patient. This would require specific physician orders on the patient's plan of care.

Summary

UI management needs to be a multifaceted approach, including identifying risk factors, dietary irritants, behavioral modifications, medication management, and pelvic floor training. Substantial evidence does exist to support these interventions in the treatment of UI. The socioeconomic-related factors to UI are great.

Screening patients for UI using the OASIS-C data item M01610 is important in the home healthcare setting to improve one's quality of life by identifying the need to treat UI. One challenge

to effective treatment in the home care setting may be the availability of specialized pelvic floor healthcare practitioners, as well as availability of biofeedback equipment to further enhance the patient's treatment and increase motivation and compliance with pelvic floor training. Most practically, pelvic floor therapists who are trained to treat UI are more readily found in the outpatient setting. However, to screen and identify this issue in the home healthcare setting may also further help the referral process to find an outpatient clinic for follow-up care for the treatment of UI. If UI is identified in the screening process, one can consult the Section on Women's Health of the APTA Web site under the "Our Patients" tab to locate a women's health physical therapy near you or visit: http://www.womenshealthapta.org/find-a-physical-therapist/index.cfm (Section on Women's Health, APTA, 2012).

Nurses, physician assistants, physical therapists, and occupational therapists can become biofeedback certified through the Biofeedback Certification Institute of America (2012). Other resources for UI-related topics are the International Continence Society and the Section on Women's Health of the APTA.

Treating UI in the home health setting can be difficult to manage when treating patients with dysfunctions and comorbidities. If the patient is going to be in home healthcare for an extended period of time, the initiation of the treatment for UI is vital. However, if the patient's goal is to get to an outpatient facility for further rehabilitation related to UI, this would be the ideal setting to initiate the program for UI with biofeedback as an adjunct to treatment. Adding pelvic floor exercises, teaching about voiding diaries, as well as receiving education on diet and water intake should be done as soon as it is identified that a patient has UI.

These seemingly simple changes can have a profound impact on the patient's quality of life as well as their finances, by having to purchase less protective garments, pads, and the like. If changes do not occur with generalized training from the home healthcare practitioner, the patient may benefit from treatment with someone who has specialized training in pelvic floor rehabilitation for further assessment and treatment. Research has shown that providing the patient with education and generalized pelvic floor knowledge alone is not as effective as clinic-based treatments (Goode et al., 2003).

With healthcare budget concerns driving the need to complete care in as few visits as possible, and still meet goals of excellent care, nurses and therapists should carry preprinted packets of UI education to get them started as soon as possible with making these everyday life changes. Home healthcare clinicians can have an important part to play in the effective assessment and management of UI. Generalized instruction and overall improvement in mobility with activities of daily living can make beneficial changes to a portion of patients living with UI.

In summary, treating UI in the home care setting and across all healthcare settings should be a priority. It is the trend that with increasing age of the population, the rate of undiagnosed UI also increases (Wallner et al., 2009). Mixed and urge UI are the most common among older adults (Reed et al., 2012). Many patients receiving home healthcare likely have had a significant change in their overall health or lifestyle, which may impact their normal function. Identifying and treating UI in the home care setting is necessary to improve the patient's quality of life and socioeconomic status. It may also decrease risk for skin breakdown or other medical complications, and improve their overall health status. ☗

***Sarah Teel, DPT**, is a Staff Physical Therapist at Peak Performance Sports and Physical Therapy, New Bern, North Carolina.*

The author and planners have disclosed that they have no financial relationships related to this article.

Address for correspondence: Sarah Teel, DPT, Peak Performance Sports and Physical Therapy, 2009 Neuse Blvd., New Bern, NC 28560 (bellapt05@yahoo.com).

DOI:10.1097/NHH.0b013e3182976091

REFERENCES

Abrams, P., Cardozo, L. D., Khoury, S., & Wein, A. (2005). *Incontinence: Management* (Vol. 2). London, England: Health Publications.

Arab, A. M., & Chehrehrazi, M. (2011). The response of the abdominal muscles to pelvic floor muscle contraction in women with and without stress urinary incontinence using ultrasound imaging. *Neurourology and Urodynamics*, *30*(1), 117-120.

Biller, D. H., & Davila, G. W. (2006). Overactive bladder: Pharmacologic therapy. In G. W. Davila, G. M.

Ghoniem, & S. D. Wexner (Eds.), *Pelvic Floor Dysfunction: A Multidisciplinary Approach* (pp. 169-174). London, England: Springer-Verlag.

Biofeedback Certification International Alliance. (2008). *Overview of biofeedback*. Retrieved from http://www.bcia.org/i4a/pages/index.cfm?pageid=3524

Biofeedback Certification International Alliance. (2012). *Requirements for certification*. Retrieved from http://www.bcia.org/files/public/PMDBBrochure.pdf

Bo, K. (2004). Pelvic floor muscle training is effective in treatment of female stress urinary incontinence, but how does it work? *International Urogynecology Journal and Pelvic Floor Dysfunction*, *15*(2), 76-84.

Bo, K. (2007). Pelvic floor muscle training. In K. Bo, B. Berghmans, S. Morkved, & M. V. Kampen (Eds.), *Evidence-Based Physical Therapy for the Pelvic Floor*. Philadelphia, PA: Elsevier.

Centers for Medicare and Medicaid Services. (2012). *OASIS-C*. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HomeHealthQualityInits/OASISC.html

Choi, H., Palmer, M. H., & Park, J. (2007). Meta-analysis of pelvic floor muscle training: Randomized controlled trials in incontinent women. *Nursing Research, 56*(4), 226-234.

Fantyl, J., Newman, D. K., Colling, J., DeLancey, J., Keeys, C., Loughery, R., …, Whitmore, K. (1996). *Urinary Incontinence in Adults: Acute and Chronic Management.* No. 2, 1996 Update AHCPR Publication No. 96-0682. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, and Agency for Health Care Policy and Research.

Goode, P. S., Burgio, K. L, Locher, J. L., Roth, D. L., Umlauf, M. G., Richter, H. E., ..., Lloyd, L. K. (2003). Effect of behavioral training with or without pelvic floor electrical stimulation on stress incontinence in women: A randomized controlled trial. *JAMA, 290*(3), 345-352.

Hamilton, R. J. (2011). *Tarascon Pocket Pharmacopoeia, 2011 deluxe Lab-Coat Pocket Edition* (12th ed.). Sudbury, MA: Jones & Bartlett Learning.

Herman & Wallace Pelvic Rehabilitation Institute. (2012). *Certification overview*. Retrieved from http://hermanwallace.com/certification

Johnson, T. M., Burgio, K. L., Redden, D. T., Wright, K. C., & Goode, P. S. (2005). Effects of behavioral and drug therapy on nocturia in older incontinent women. *Journal of the American Geriatrics Society, 53*(5), 846-850.

Kegel, A. (1948). The non-surgical treatment of genital relaxation. *Annals of Western Medicine and Surgery, 2*, 213-216.

Laycock, J., & Haslem, J. (2008). *Therapeutic Management of Incontinence and Pelvic Pain* (2nd ed.). London, England: Springer.

Paraiso, M. F. R., & Abate, G. (2006). Timed voiding and fluid management. In G.W. Davila, G. M. Ghonieum, & S. D. Wexner (Eds.), *Pelvic Floor Dysfunction: A Multidisciplinary Approach.* London, Englnad: Springer Verlag.

Reed, J., Clarke, C., & Macfarlane, A. (2012). *Nursing Older Adults.*Berkshire, England: Open University Press, McGraw Hill Education.

Rudy, D., Cline, K., Harris, R., Goldberg, K., & Dmochowski, R. (2006). Multicenter Phase III trial studying trospium chloride in patients with overactive bladder. *Urology, 67*(2), 275-280.

Sapsford, R. (2004). Rehabilitation of pelvic floor muscles utilizing trunk stabilization. *Manual Therapy, 9*(1), 3-12.

Section on Women's Health. (2011). Certificate of Achievement in Pelvic PT (CAPP-Pelvic). Retrieved from https://www.womenshealthapta.org/education/pelvic.cfm

Section on Women's Health, APTA. (2012). Women's health physical therapist locator. Retrieved from http://www.womenshealthapta.org/find-a-physical-therapist/index.cfm

Shamliyan, T. A., Kane, R. L., Wyman, J., & Wilt, T. J. (2008). Systematic review: Randomized, controlled trials of nonsurgical treatments for urinary incontinence in women. *Annals of Internal Medicine, 148*(6), 459-473.

Sherburn, M., Murphy, C. A., Carroll, S., Allen, T. J., & Galea, M. P. (2005) Investigation of transabdominal real-time ultrasound to visualise the muscles of the pelvic floor. *Australian Journal of Physiotherapy, 51*(3), 167-170.

Wallner, L. P., Porten, S., Meenan, R. T., O'Keefe Rosetti, M. C., Calhoun, E. A., Sarma, A. V., & Clemen, J. Q. (2009). Prevalence and severity of undiagnosed urinary incontinence in women. *American Journal of Medicine, 122*(11), 1037-1042.

Wilson, P. D., Bo, K., & Hay-Smith, J. (2002). Conservative treatment in women. In P. Abrams, L. Cardozo, S. Khoury, A. Wein (Eds.), *Incontinence* (2nd ed.). Plymouth, England: Plymbridge Distributors.