Published in final edited form as:

Top Geriatr Rehabil. 2016 ; 32(4): 251–257. doi:10.1097/TGR.0000000000000119.

Analysis of Physical Therapy Intervention Outcomes for Urinary Incontinence in Women Older Than 65 Years in Outpatient Clinical Settings

Cynthia E. Neville^{1,2}, Jason Beneciuk^{3,4}, Mark Bishop^{4,5}, and Meryl Alappattu^{4,5}

¹University of North Florida, Department of Physical Therapy, Jacksonville, Florida

²SmartBody Physical Therapy, Jacksonville, Florida

³Brooks Rehabilitation - University of Florida, College of Public Health and Health Professions Research Collaboration, Jacksonville, Florida

⁴University of Florida, Department of Physical Therapy, Gainesville, Florida

⁵University of Florida, Pain Research and Intervention Center of Excellence, Gainesville

Abstract

BACKGROUND—Conservative interventions provided by physical therapists for the treatment of bladder control problems in adult females are strongly supported in the literature and in clinical practice guidelines. However, physical therapy (PT) intervention outcomes specifically for women over the age of 65 with urinary incontinence (UI) in outpatient settings in the United States have not been extensively reported.

OBJECTIVES—To provide preliminary PT intervention outcome data specific to female patients over the age of 65 receiving outpatient physical therapy for urinary incontinence.

DESIGN—Preliminary retrospective analysis of a convenience sample of women ages 65 to 93

METHODS—Women over the age of 65 with UI who were referred to outpatient PT and answered "YES" to a UI screening question at intake completed 3 UI surveys (3 Incontinence Questions (3IQ), Incontinence Impact Questionnaire Short-Form (IIQ-7) and the International Consultation on Incontinence Modular Questionnaire- Urinary Incontinence (ICIQ-UI). Patients received individualized treatment provided by a physical therapist. Physical therapists were asked to administer the surveys again during and/or after treatment. Demographic, clinical, and health related quality of life (HRQoL) data were collected. Frequency of UI types, UI symptoms, and

Primary and Corresponding Author: Cynthia E. Neville PT, DPT, WCS, University of North Florida, Department of Physical Therapy, and SmartBody Physical Therapy, Jacksonville, Florida, cindynevillept@gmail.com, 1839 Ocean Grove Dr. Atlantic Beach, FL 32233 Phone: 904-755-2628.

Jason Beneciuk *Brooks Rehabilitation - University of Florida, College of Public Health and Health Professions Research Collaboration, Jacksonville, Florida, and University of Florida, Department of Physical Therapy, Gainesville, Florida*

Mark Bishop, PT, PhD *University of Florida, Department of Physical Therapy, Gainesville, Florida and University of Florida, Pain Research and Intervention Center of Excellence, Gainesville*

Meryl Alappattu, PT, DPT, PhD *University of Florida, Department of Physical Therapy, Gainesville, Florida and University of Florida, Pain Research and Intervention Center of Excellence, Gainesville*

ETHICS COMMITTEE: The University of Florida Institutional Review Board approved this study.

impact of QoL were analyzed. Paired samples t-test was used to evaluate the change in measures between the initial survey and a follow up survey.

RESULTS—Surveys were collected from 62 women. Significant changes in scores on two outcome measures (ICIQ-UI and IIQ-7) indicated significant reductions in UI symptom severity and improvements in UI- related HRQoL after undergoing individualized physical therapy treatment for UI.

LIMITATIONS—The study population was a convenience sample. Data on treatment interventions was not collected.

CONCLUSIONS—Individualized interventions provided by physical therapists have the potential to significantly improve symptom severity and HRQoL in women over age 65 with different types of UI.

Keywords

outcome measures; urinary incontinence; physical therapy; ICIQ-UI; IIQ-7

INTRODUCTION

Urinary incontinence (UI), the involuntary loss of urine, is a costly worldwide problem that has a negative impact on function and quality of life¹ⁱ Bladder control problems, including UI, urinary urgency, urinary frequency, and nocturia (waking from sleep at night to urinate) disproportionately affect older women². In middle age and in postmenopausal women aged 40 –65, 44%–57% are affected³ and incontinence may affect up to 75% of women over the age of 75^{4 ii}

The scientific literature contains a number of high quality studies, systematic reviews, and clinical practice guidelines, which strongly support conservative interventions for the treatment of adult bladder control problems.^{5–9} Evidence based interventions for the treatment of bladder control problems include pelvic floor muscle training (PFMT), neuromuscular electrical stimulation, perineal biofeedback training, and behavioral strategies such as bladder training. (See Table 1). Although these interventions may be provided by physical therapists, little is known about the outcomes of these treatments in women over the age of 65.

Treatment of bladder control problems by physical therapists is becoming more commonly available in the United States. Yet, the outcomes of treatment for UI provided by physical therapists have not been extensively reported, particularly for female patients over the age of 65. This lack of information is In part due to limited use and reporting of standardized, objective measures by physical therapists treating women with UI in clinical practice to measure symptom severity and quality of life. Therefore, the purpose of this study is to report preliminary outcomes of female patients over the age of 65 undergoing physical therapy treatment for urinary incontinence in outpatient physical therapy settings using standardized validated outcome measures of both UI symptom severity and UI related quality of life.

METHODS

Overview

This retrospective analysis is an analysis of data collected from patients attending outpatient rehabilitation at clinics in a large health care system (Brooks Rehabilitation) in north and north central Florida between April 2010 and December 2013. Demographic, clinical, and HRQoL data were collected by self-report from female patients between the ages of 21 and 93 years who were seeking outpatient services for lower urinary tract symptoms and also answered “yes” to a urinary incontinence screening question administered on the standard outpatient initial medical history questionnaire intake paperwork. Data for this analysis was generated from the subset of women between ages 65 and 93 years.

All patients across the outpatient health system were screened. Some women with an initial medical diagnosis of another lower urinary tract symptom such as pelvic organ prolapse may not have had an initial referral diagnosis of UI. They were not included in this analysis unless they answered “yes” to the screening question. These patients then answered questions from 3 standardized validated incontinence outcomes surveys, described below. Survey answers were entered into a custom database by the evaluating physical therapist, who participated voluntarily in the data entry. Patients underwent individualized physical therapy treatment. Physical therapists were asked to administer follow up surveys during the course of treatment and at the conclusion of care, and enter the results into the database. The University of Florida Institutional Review Board approved this study.

Measures

Demographic and Diagnosis—Data for age (in years), length of stay (LOS, days), number of treatments, and primary and secondary International Classification of Disease (ICD-9) codes for which the patient was seeking care (Table 2) were collected at intake.

Urinary Incontinence Screening—The screening question on intake was the initial question in the 3 Incontinence Questions (3IQ)¹⁰ and asks “During the last 3 months, have you leaked urine (even a little bit)?” If a patient responded *YES* to this question, she was also administered the following incontinence measures: 3 Incontinence Questions (3IQ), Incontinence Impact Questionnaire Short-Form (IIQ-7)ⁱⁱⁱ¹¹ and the International Consultation on Incontinence Modular Questionnaire- Urinary Incontinence (ICIQ-UI)¹²

Incontinence Measures: 3 Incontinence Questions (3IQ): The 3IQ is a self-report form developed for use in primary care settings to distinguish between different types of urinary incontinence (stress UI, urge UI, mixed UI, other/insensible UI) in order to initiate effective therapies prior to an extended medical evaluation¹⁰. Brown et al¹⁰ reported that for classification of urge incontinence and with urodynamic evaluation as the gold standard, the 3IQ had a sensitivity of 0.75 (95% CI, 0.68 to 0.81), a specificity of 0.77 (CI, 0.69 to 0.84), and a positive likelihood ratio of 3.29 (CI, 2.39 to 4.51). For classification of stress incontinence, the sensitivity was 0.86 (CI, 0.79 to 0.90), the specificity was 0.60 (CI, 0.51 to 0.68), and the positive likelihood ratio was 2.13 (CI, 1.71 to 2.66). Table 3 provides the

International Continence Society definitions of the types of UI¹³, and the correlating 3IQ choice option of when the patient leaked most often during the last 3 months.

Incontinence Impact Questionnaire (IIQ-7): The IIQ-7 is a self-report measure of the impact of UI on physical activity, social relationships, travel, and emotional health and is, therefore, proposed to measure UI related quality of life¹⁴. This measure contains seven items scored on a 4-point Likert scale. The average score is transformed to provide a potential scores ranging form 0 to 100. Higher scores are indicative of increased impact on quality of life.¹⁴ The IIQ-7 has been reported to show good internal consistency, reproducibility, construct validity, and responsiveness.¹⁵ One study has reported the Minimally Detectable Change (MCD) in the IIQ- 7 as a decrease by 28.3 points¹⁵.

International Consultation on Incontinence Modular Questionnaire- Urinary Incontinence (ICIQ-UI): The ICIQ-UI is a four-item self-report measure used to assess the impact of UI symptoms on quality of life as well as symptom severity. This measure assesses frequency of UI, amount of leakage, and overall impact of UI. The score ranges from 0 to 21 with greater scores indicative of increased symptom severity and impact¹². The ICIQ-UI demonstrates good construct validity and reliability¹⁷ The minimum important difference (MID) for the ICIQ-UI was reported to be a decrease by 5 points at 12 months and decrease by 4 points at 24 months by Sirls in 2015¹⁸. Nystrom reported the MID for a population of adult women with stress incontinence to be a decrease by 2.52 points at 4 months¹⁹.

Data Entry—The evaluating physical therapist was asked to enter the answers of the initial patient surveys into a custom database. Physical therapists were asked to administer the surveys again during the course of treatment and at the conclusion of care, and enter the answers into the database. Participation in collecting and entering data into the database by physical therapists was voluntary. All surveys were scanned and entered into the patient's electronic medical record. Patient demographic information was collected when the survey responses in the custom database were electronically associated from the electronic medical record. All identifying patient information was removed prior to analysis.

Interventions

Overview—Patients underwent individualized treatment interventions, described in Table 1, provided by one or more physical therapists specifically trained and qualified in evaluating and treating pelvic floor impairments and bladder control problems. Treatment interventions were determined by the physical therapist(s) based on: 1) the individual's impairments, 2) the type of UI, and 3) insurance payor approval of coverage for some interventions. Data regarding the specific types and frequencies of interventions provided by the physical therapists was not collected.

Data Analysis—Demographic information, frequency of UI type (from the 3IQ: stress UI, urge UI, mixed UI, or insensible UI), incontinence symptoms IIQ-7, and ICIQ-UI), length of stay, and number of visits were calculated. Paired samples T-test was used to evaluate

changes in measure between the first and second survey time points. All analyses were completed with IBM SPSS statistical software, version 20. Alpha level was set at 0.05.

RESULTS

Sixty two women over the age of 65 were identified in the database of female patients ranging from age 21–93, who answered “yes” to the initial screening question and who also had a qualifying UI ICD-9 code. (Table 3). Patients in this study had a mean age of 73.4 years (range = 65 to 93, SD = 6.34), and received 8.18 (range =1–19, SD =4.56) treatment visits over 61 (range 12–168, SD = 31.02) days.

Rates of self reported types of UI from the 3IQ and mean numbers of visits by type of UI are shown in Figure 1. More than half (n=35) of the women in this sample reported urgency UI, and approximately one quarter (n=15) of the women were initially unaware of the circumstances surrounding their symptoms of urine leakage (insensible UI).

Thirty eight percent of patients (n = 24) provided data during treatment and 60% (n = 37) provided data on discharge or during the immediately treatment session before discharge from physical therapy care. Statistically significant decreases in scores on both the ICIQ-UI and the IIQ-7 were observed between the first and second survey. The mean difference in the ICIQ-UI score was 1.78, (p=0.001), indicating a reduction in symptoms severity and bother from urinary incontinence. The mean difference in the IIQ-7 score was 9.35, (p=0.003) indicating a decrease in the negative impact of incontinence symptoms on HRQoL. (Figure 2).

DISCUSSION

The purpose of this study is to report the preliminary outcomes of female patients over the age of 65 who underwent outpatient physical therapy treatment for urinary incontinence. Our results indicate that in this sample of women who indicated they had leaked urine in the last 3 months 1) the primary type of incontinence reported was urgency UI, and 2) individualized interventions provided by physical therapists resulted in statistically significant reductions in symptom severity scores indicated by changes in the ICIQ-UI score, and significant improvements UI-related HRQoL scores as measured with the IIQ-7.

Physical therapists’ ability to demonstrate positive outcomes promotes physical therapy as a value based treatment option^{20,21} Our study provides preliminary support for positive outcomes from outpatient treatment of urinary incontinence provided by physical therapists in female patients over the age of 65. Physical therapists are increasingly expected to measure and report outcomes of interventions in clinical practice, however barriers still exist in meeting these expectations. The stakes are increasing for physical therapists to understand the results achieved from physical therapy interventions and to demonstrate positive meaningful outcomes of these interventions in clinical practice^{21,22} The measurement and reporting of clinical outcomes of interventions provided by physical therapists will directly impact reimbursement for outpatient physical therapy services in the future, which has implications for health policy decision making. The American Physical Therapy Association recommends that physical therapists consider the results of standardized outcome measures

in the calculus of determining how to report a patient's functional limitations using billing codes (G-codes)²³. The US Government's Center's for Medicare and Medicaid Services (CMS)²⁴ analysis of G-codes in functional limitation reporting will lead to the reform of payment for outpatient therapy services based on these outcomes in the future²² The functional reporting mandate by CMS is likely to stimulate an increase in the use of clinical outcome measures in the clinical practice of geriatric patients. However, the widespread routine use of and reporting of outcomes in physical therapist practice remains limited, inconsistent, and challenging^{22, 25}

The interpretation of the meaning of the changes in the outcomes scores in our study is debatable. While the changes in these outcomes scores were statistically significant, they did not meet published criteria for MID or MCD for either measure. The population in this study was a group of geriatric women with one of 4 types of incontinence. The population of women in the studies reporting MIDs and MCDs is distinctly different, and the time frames for achieving MIDs is longer than the time frame of our study. The MCD for the IIQ-7 was reported on women 6 months following pelvic surgery¹⁵. The MIDs for the ICIQ-UI are reported on either women with only stress incontinence, or on women of all ages.^{18, 19} The mean length of treatment for the women in this study was 61 days, a full month short of the 4 month time frame to reach the MIDs the ICIQ-UI reported in the literature^{18, 19} In clinical practice, the length of treatment of women undergoing physical therapy interventions for incontinence varies based on a wide range of factors possibly including ability to pay for treatment, insurance coverage, and stopping treatment before the intervention is completed. The discrepancies between populations, age groups, and time frames for comparing the MIDs and MCDs to the length of treatment in our population may explain why the MID and MCDs were not attained by our group. Therefore, future studies are required to provide estimates of clinically meaningful change that are relevant for specific patient populations.

The rates of the types of UI in our cohort are consistent with rates reported in other studies^{2, 26}. Urgency UI and symptoms of overactive bladder are the most prevalent in the geriatric population. Interestingly, we found that 24% or 15 of the women initially classified their UI as "insensible", based on their answer to the 3IQ. This indicated that they were initially unaware of circumstances surrounding urine leakage. While physical therapists based their interventions on impairments identified during the initial evaluation, treatments for UI are also based on the type of UI. This challenge of correctly classifying the type of UI is a factor that may have influenced the choice of interventions and thus also these outcomes.

In clinical practice the physical therapist must interpret the scores of outcome measures along with other physical performance measures, such as muscle strength and endurance, and functional performance measures, such as number of pads used, and number of episodes of urine leakage when deciding whether an intervention has been successful. We did not collect any other physical performance or functional performance measures. Nor did we collect data on which specific treatment interventions were performed. We cannot draw conclusions as to if any specific intervention or combination of interventions resulted and a difference in outcomes. This lack of information regarding performance and functional measures, and interventions is a limitation of this study.

We were not able to determine the total number of women that were screened or treated for bladder control problems or pelvic floor muscle impairments in the health system during this time period. Nor did we collect any additional health information such as smoking history or the presence of other health conditions, such as diabetes or obesity, which may have impacted the response to treatment; therefore we cannot speculate as to whether this sample of convenience is a truly representative group of older women undergoing physical therapy treatment for UI. Collection of a more comprehensive set of data on a larger group of adults of all ages will potentially allow for future validation of these results. Yet, because so few reports exist on such outcomes, in this small convenience sample of heterogeneous women with different types of urinary incontinence, collection and reporting of outcomes of intervention using standardized validated outcome measures is strength of this study.

CONCLUSION

These preliminary data suggest that individualized interventions for urinary incontinence provided to a heterogeneous group of older women by physical therapists skilled in providing treatment interventions for urinary incontinence have the potential to improve symptom severity and UI-related quality of life as demonstrated by using standardized outcome measures. Although these data represent a small convenience sample, and the collection and analysis of outcome measures presented practical challenges in the complexity of the clinical setting, they also show that measuring and reporting outcomes of treatment interventions for urinary incontinence in clinical physical therapist practice is feasible, and provides potentially valuable information about clinical care.

More research with larger sample sizes examining outcomes of interventions provided by physical therapists for the treatment of bladder control problems in older women is needed. A planned future analysis of the larger dataset from this database will potentially provide further insight. Future studies should explore methods for simplifying the collection, analysis, and reporting of repeated outcome measures over time in this specialty area of physical therapist clinical practice. Outcomes studies in the future should investigate the rate and use of specific interventions for treatment of bladder control problems based on the classification of types of UI and types of musculoskeletal impairments. As the aging population of the United States and the world is growing rapidly, more research is needed to understand the outcomes of physical therapy treatment for urinary incontinence in women over the age of 65. This research may have important implications for health care policy decision making of the future.

Acknowledgments

The authors would like to acknowledge and thank the physical therapists at Brooks Rehabilitation who collected and entered survey data for this study.

CONFLICTS OF INTEREST AND FUNDING: Funding: Foundation for Physical Therapy, National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Center for Medical Rehabilitation Research for Dr. Alappattu. This manuscript was written while Dr. Beneciuk received support from the National Institutes of Health Rehabilitation Research Career Development Program (K12-HD055929).

References

1. Minassian V, Drutz H, Al-Badr A. Urinary incontinence as a worldwide problem. *International Journal Of Gynecology & Obstetrics*. 2003; 82(3):327–338. [PubMed: 14499979]
2. Wehrberger C, Madersbacher S, Jungwirth S, Fischer P, Tragl K. Lower urinary tract symptoms and urinary incontinence in a geriatric cohort - a population-based analysis. *BJU International*. 2012; 110(10):1516–1521. [PubMed: 22409717]
3. Kinchen K, Burgio K, Diokno A, Fultz N, Bump R, Obenchain R. Factors associated with women's decisions to seek treatment for urinary incontinence. *Journal Of Women's Health*. 2003; 12(7):687–698.
4. Sampsel CM, Harlow SD, Skurnick J, Brubaker L, Bondarenko I. Urinary incontinence predictors and life impact in ethnically diverse perimenopausal women. *Obstet Gynecol*. 2002; 100:1230–1238. [PubMed: 12468167]
5. Dumoulin C, Hay-Smith J, Habée-Séguin G, Mercier J. Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women: A short version Cochrane systematic review with meta-analysis. *Neurourology And Urodynamics*. 2015; 34(4):300–308. [PubMed: 25408383]
6. Wallace, S. *Cochrane Database Of Systematic Reviews* [serial online]. Ipswich, MA: Cochrane Database of Systematic Reviews; 2008 Nov 4. Bladder training for urinary incontinence in adults. Available from: [Accessed April 16, 2016]
7. Herderschee R, Hay-Smith EJ, Herbison GP, et al. Feedback or biofeedback to augment pelvic floor muscle training for urinary incontinence in women. *Neurourol Urodyn*. 2013; 32(4):325–329. [PubMed: 23239361]
8. Slovak M, Chapple C, Barker A. Non-invasive transcutaneous electrical stimulation in the treatment of overactive bladder. *Asian Journal of Urology*. 2015; 2:92–101.
9. Qaseem A, Dallas P, Forciea M, Starkey M, et al. Nonsurgical management of urinary incontinence in women: a clinical practice guideline from the American College of Physicians. *Annals Of Internal Medicine*. 2014; 161(6):429–440. [PubMed: 25222388]
10. Brown J, Wing R, Kanaya A, et al. Lifestyle intervention is associated with lower prevalence of urinary incontinence: the Diabetes Prevention Program. *Diabetes Care*. 2006; 29(2):385–390. [PubMed: 16443892]
11. Shumaker SA, Wyman JF, Uebersax JS, et al. Health-related quality of life measures for women with urinary incontinence: the Incontinence Impact Questionnaire and the Urogenital Distress Inventory. *Qual Life Res*. 1994; 3(5):291–306. [PubMed: 7841963]
12. Avery K, Donovan J, Peters TJ, et al. ICIQ: a brief and robust measure for evaluating the symptoms and impact of urinary incontinence. *Neurourol Urodyn*. 2004; 23(4):322–330. [PubMed: 15227649]
13. Haylen BT, de Ridder D, Freeman RM, et al. International Urogynecological Association; International Continence Society. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. *Neurourol Urodyn*. 2010; 29(1):4–20. [PubMed: 19941278]
14. Uebersax JS, Wyman JF, Shumaker SA, et al. Short forms to assess life quality and symptom distress for urinary incontinence in women: the Incontinence Impact Questionnaire and the Urogenital Distress Inventory. *Continence Program for Women Research Group. Neurourol Urodyn*. 1995; 14(2):131–139. [PubMed: 7780440]
15. Barber M, Walters M, Bump R. General Obstetrics and Gynecology: Gynecology: Short forms of two condition-specific quality-of-life questionnaires for women with pelvic floor disorders (PFDI-20 and PFIQ-7). *American Journal Of Obstetrics And Gynecology*. 2005; 193(1):103–113. 11p. [PubMed: 16021067]
16. Utomo E, Korfae I, Wildhagen M. 2015 Validation of the Urogenital Distress Inventory (UDI-6) and Incontinence Impact Questionnaire (IIQ-7) in a Dutch Population. *Neurourol Urodyn*. 2015; 34:24–31. [PubMed: 24167010]

17. Klovning A, Avery K, Sandvik H, et al. Comparison of two questionnaires for assessing the severity of urinary incontinence: The ICIQ-UI SF versus the incontinence severity index. *Neurourol Urodyn*. 2009; 28:411–415. [PubMed: 19214996]
18. Sirls L, Tennstedt S, Brubaker L, et al. 2015 The Minimum Important Difference for the International Consultation on Incontinence Questionnaire—Urinary Incontinence Short Form in Women with Stress Urinary Incontinence. *Neurourol Urodyn*. 2015; 34:183–187. [PubMed: 24273137]
19. Nystrom E, Sjostrom M, Stenlund H, Samuelsson E. ICIQ symptom and quality of life instruments measure clinically relevant improvements in women with stress urinary incontinence. *Neurourol Urodyn*. 2015; 34(8):747–751. [PubMed: 25154378]
20. Jewell D, Moore J, Goldstein M. Delivering the Physical Therapy Value Proposition: A Call to Action. *Physical Therapy*. 2013; 93(1):104–114. [PubMed: 23001526]
21. Stevans J, Bise C, McGee J, Miller D, Rockar P Jr, Delitto A. Knowledge Translation and Implementation Special Series. Evidence-Based Practice Implementation: Case Report of the Evolution of a Quality Improvement Program in a Multicenter Physical Therapy Organization. *Phys Ther*. 2015; 95(4):588–599. [PubMed: 25573756]
22. Jette DU, Halbert J, Iverson C, et al. Use of standardized outcome measures in physical therapist practice: perceptions and applications. *Phys Ther*. 2009; 89:125–135. [PubMed: 19074618]
23. Functional Limitation Reporting Under Medicare. [accessed on January 16, 2016] <http://www.apta.org/Payment/Medicare/CodingBilling/FunctionalLimitation/>.
24. [accessed January 16, 2016] HCPCS Quarterly Update. <https://www.cms.gov/Medicare/Coding/HCPCSReleaseCodeSets/HCPCS-Quarterly-Update.html>
25. Sullivan JE, Andrews AW, Lanzino D, et al. Outcome measures in neurological physical therapy practice, part II: a patient-centered process. *J Neurol Phys Ther*. 2011; 35:65–74. [PubMed: 21934361]
26. Irwin D, Kopp Z, Agatep B, Milsom I, Abrams P. Worldwide prevalence estimates of lower urinary tract symptoms, overactive bladder, urinary incontinence and bladder outlet obstruction. *BJU International*. 108(7):1132–1138.

Figure 1.
Rates of Self Reported UI n=62

Figure 2.
Changes in Mean IIQ-7 and ICIQ-UI Scores Over Time

Table 1

Interventions Provided by Physical Therapists for Treatment of Urinary Incontinence and Pelvic Floor Muscle Impairments

Intervention	Description
Behavioral interventions	Voiding diary: Patient was instructed to keep track of the timing and amount of fluid intake, voiding episodes, leakage episodes, experience of urgency, details of circumstances surrounding episodes of leakage, and number of pads for up to 4 days. The physical therapist and patient typically analyzed the voiding log together.
	Fluid Management strategies: Elimination or reduction of fluids suspected of irritating the bladder. Optimizing fluid / water intake volumes
	Timed Voiding: Program of scheduled voids designed to reduce episodes of urine leakage.
	Urgency Inhibition strategies: pelvic floor muscle contraction to inhibit bladder detrusor muscle contraction
	Nocturia strategies: techniques to avoid waking to urinate such as decreasing fluid intake 3 hours before sleep
Educational interventions	Education regarding normal and abnormal bladder function and habits, and the possible effect of different fluids on bladder symptoms. Education about pelvic floor muscle disorders and treatments.
Pelvic floor muscle rehabilitation and training	Individualized pelvic floor muscle training (PFMT) consisting of individually prescribed pelvic floor muscle exercises of muscle contraction and relaxation in progressive intervals designed to build motor control, coordination, strength, endurance, hypertrophy, and stiffness of the pelvic floor muscles
	Surface electromyography (sEMG) biofeedback to enhance motor learning of pelvic floor muscle function on an individual basis, using surface electrodes on the perineum or using intra-vaginal or intra-anal electrode sensors
Manual physical therapy	Individualized manual therapy such as lumbo-pelvic-hip joint mobilization, manual stretching of muscles, and manipulation of soft tissues and scar.
Neuromuscular electrical stimulation (NMES)	Transcutaneous electrical nerve stimulation using surface electrodes on the sacral nerve roots S2–S4, on the tibial nerve at the ankle posterior -medial to the medial malleolus, or over the bladder suprapubically, or using surface electrodes on the perineum or using intra-vaginal or intra-anal electrode sensors. Frequency of 50 Hz for pelvic floor muscle reeducation or 12 Hz for bladder detrusor muscle inhibition, 200 – 300 microvolts pulse width, individualized on/off cycles and duration.

Table 2

Primary and Secondary ICD-9 Codes of Subjects

ICD-9 Code	Description
625.6	FEMALE STRESS INCONTINENCE
625.8	FEMALE GENITAL SYMPTOMS NEC
625.9	FEMALE GENITAL SYMPTOMS NOS
627.3	ATROPHIC VAGINITIS
788.2	RETENTION OF URINE NOS
788.21	INCOMPLETE BLADDER EMPTYING
788.29	RETENTION OF URINE NEC
788.3	UNSPECIFIED URINARY INCONTINENCE
788.31	URGE INCONTINENCE
788.33	INCONTINENCE - MIXED (MALE/FEMALE)
788.34	INCONTINENCE WITHOUT SENSORY AWARENESS
788.35	POST-VOID DRIBBLING
788.36	NOCTURNAL ENURESIS
788.37	CONTINUOUS LEAKAGE
788.38	OVERFLOW INCONTINENCE
788.39	OTHER URINARY INCONTINENCE
788.41	URINARY FREQUENCY
	Prolapse and weakness diagnoses included only if also associated with UI ICD9
728.87	MUSCLE WEAKNESS (GENERALIZED)
618	GENITAL PROLAPSE * DO NOT USE *
618	UNSPECIFIED PROLAPSE OF VAGINAL WALLS
618.01	CYSTOCELE, MIDLINE
618.02	CYSTOCELE, LATERAL
618.03	URETHROCELE
618.04	RECTOCELE
618.05	PERINEOCELE
618.09	OTHER PROLAPSE OF VAGINAL WALLS
618.1	UTERINE PROLAPSE
618.2	UTEROVAG PROLAPS-INCOMPL
618.3	UTEROVAG PROLAPS-COMPLET
618.4	UTERVAGINAL PROLAPSE NOS
618.5	POSTOP VAGINAL PROLAPSE
618.6	VAGINAL ENTEROCELE

Table 3

Types of Urinary Incontinence (UI) and Corresponding International Continence Society (ICS) and 3 Incontinence Questionnaire (3IQ) Definitions

Type of UI	International Continence Society definition ¹³	Corresponding 3IQ description ¹⁰ “leaked most often when...”
Urgency UI	Complaint of involuntary loss of urine associated with urgency	“...you had the feeling that you needed to empty your bladder but you could not get to the toilet fast enough?”
Stress UI	Complaint of involuntary loss of urine on effort or physical exertion (e.g., sporting activities), or on sneezing or coughing	“...you were performing some physical activity such as coughing, sneezing, lifting, or exercise?”
Mixed UI	Complaint of involuntary loss of urine associated with urgency and also with effort or physical exertion or on sneezing or coughing.	“...about equally as often with physical activity as with a sense of urgency?”
Insensible incontinence	Complaint of involuntary loss of urine unaccompanied by either urgency or stress incontinence provocative factors.	“...without physical activity and without a sense of urgency?”