Platform Presentations

COMMUNITY BASED FALL PREVENTION SCREENING AND ACTION DISSEMINATED THROUGH THE MN CHAPTER MEMBERSHIP NETWORK. K.J. Gjerde, MN Chapter, APTA, Roseville, MN.

Purpose: 1. To create system change that will move fall risk screening from the traditional medical model to a community based model, expanding potential reach and uptake. Create an evidence based and practical fall prevention program disseminated through use of MN Chapter PT membership. Once trained, the physical therapists train community based program staff to conduct the actual screening of adults, age 65 and older. 2. Develop a brochure that will foster use of the tool either by group or by self assessment and provide instruction on action steps to be taken. **Description:** MN Chapter, APTA, Outcomes Workgroup developed a basic falls prevention program and a strategy using Chapter membership to recruit and train physical therapists in the program. Physical therapists then identified and instructed community partners in program application. Community partners conducted screenings of groups and/or individuals and instructed participants in two simple action steps that will reduce their risk of falling. The screening uses the 'timed sit to stand' protocol to assess lower body strength and to guide remedial action. Individuals determine their own risk and decide if they are able move forward independently or if they require consultation with their PT or MD. Physical therapists serve as ongoing resources for their communities. This project is funded through a grant from the MN Department of Human Services, Division on Aging. **Summary of Use**: MN Chapter, APTA, has trained 28 physical therapists in this falls prevention protocol, working in collaboration with a county based healthplan (PrimeWest Health), MN River Area Agency on Aging, and ten county public health departments. These physical therapists then trained community partners, who provide fall risk screening and action steps to residents of their communities. Focus groups participated in trial screenings, guiding development of the project brochure. Actual screening of participants began in May 2006. Data will be collected regarding risk level determination and follow up action taken by those screened. Initial results will be collected by December 2006. Targeted community based partners include: assisted living sites, adult day programs, medical offices, senior centers, Area Agencies on Aging sites, faith-based groups, and other groups identified by the collaborating partners. **Importance to Members:** This project provides basic action steps to prevent falls and uses the MN Chapter membership network to distribute this community based fall risk protocol. Physical therapists initiate collaboration and serve as resources for senior in their communities. In turn, seniors are afforded multiple community based opportunities to be screened for risk of falling or to independently screen themselves followed by instruction to reduce their risk. Physical Therapists become established as a valuable fall prevention resources.

CHANGES IN FLEXED POSTURE, MUSCULOSKELETAL IMPAIRMENTS AND PHYSICAL PERFORMANCE FOLLOWING GROUP EXERCISE IN COMMUNITY-DWELLING OLDER WOMEN. W. Katzman, Physical Therapy and Rehabilitation Science, University of California San Francisco, San Francisco, CA.

Purpose/Hypothesis: Flexed posture commonly increases with age and has been associated with impaired physical performance in older women. The purpose of this study was to determine whether improvements in flexed posture, strength, range of motion (ROM) and physical performance would be observed after 12-weeks of group exercise. It was hypothesized that a targeted multi-dimensional exercise intervention designed to improve known strength, range of motion and postural alignment impairments associated with flexed posture would correlate with significant improvement in measures of flexed posture, strength, ROM, and physical performance. A second aim was to determine whether baseline measures of age, bone density T-score, number of vertebral compression fractures (VCF), flexed posture, strength, ROM, physical performance, or change in measures of strength or ROM were associated with change in measures of flexed posture. It was hypothesized that baseline characteristics, change in strength and change in ROM would affect change in measures of flexed posture. A third aim was to determine whether change in measures of flexed posture was associated with change in physical performance. **Subjects**: Twenty-one women with thoracic kyphosis ≥ 50°, recruited from an out-patient academic medical center. **Materials/Methods**: This was a single group pretest-posttest design. Two pretest measurements were performed to determine test retest reliability and measurement variability. All participants were tested before and after a 2x/week for 12-week multi-dimensional group exercise intervention. Primary dependent measures of flexed posture included kyphosis, forward head and height. Other dependent measures included spinal extensor muscle strength, shoulder/hip/knee ROM, balance, Modified Physical Performance Test (PPT), Jug Test, and gait speed. **Results:** Baseline kyphosis was 57°±5.0°, age was 72.0±4.2 years. All measurements had good to excellent test retest reliability, except left shoulder flexion and left popliteal angle (ICC .73 and .67 respectively). At the end of the exercise program there were significant improvements in usual and best kyphosis (-6°±3°; -5°±3°, $p<.001$), spinal extensor muscle

strength (21%±13% peak torque/body weight, p<.001), popliteal angle (right 7°±7°; left 9°±10°, p<.001), Modified PPT (2±2 points, p<.001), and Jug Test(-1.4±1.3 s, p<.001). Age and Modified PPT at baseline correlated with change in kyphosis, r=0.5, p=0.02 and r=0.42, p=0.055 respectively. There were no other significant associations between baseline measurements, change in strength, change in ROM, or change in physical performance and change in flexed posture. **Conclusions**: Multi-dimensional group exercise reduced measured kyphosis, improved strength, ROM and physical performance. **Clinical Relevance**: This study provides a promising exercise intervention that may improve posture and physical performance in older women with flexed posture.

THE IMPACT OF RESISTANCE TRAINING ON BALANCE AND FUNCTIONAL ABILITY OF A PATIENT WITH MULTIPLE SYSTEM ATROPHY. F. Wedge, J. Braswell, Physical Therapy, University of Alabama, Birmingham, AL.

Background & Purpose: The purpose of this case study is to document the impact of a resistance training program on a female patient with Multiple System Atrophy. Multiple System Atrophy (MSA) is a sporadic, progressive neurodegenerative disease of undetermined etiology. The disease is characterized by extrapyramidal, pyramidal, cerebellar and autonomic dysfunction that can occur in any combination. One characteristic of MSA is poorly Levodopa responsive Parkinsonism. There appears to be very little published literature on Physical Therapy as an intervention for people with MSA. **Case Description**: The patient was a 68-year-old female who was diagnosed with MSA two years prior to the start of care. The diagnosis of possible MSA was given based on the presence of Parkinsonism, bladder impairment and hyperreflexia. The patient was referred to physical therapy with a history of falls, increasing loss of balance and a rapidly progressing lower body Parkinsonism. Unlike many patients with MSA orthostatic hypotension was not a problem. The patient exhibited a fluctuating gait pattern that showed evidence of hypokinesia and at times a festinating gait. Gait was made worse in dual task situations. A rolling walker was used for ambulation although the patient was able to ambulate short distances without a device dependent on the medication cycle and fatigue. Transfers sit to stand were independent but with decreased safety and poor body mechanics. Manual muscle testing of the lower extremities revealed ankle musculature, quads and hamstrings to be weaker than hip musculature but overall strength was 4-/5 to 4/5. The patient's goal for physical therapy was that she would be able to remain at home and continue to care for herself and disabled spouse. A lower extremity resistance training program was added to an existing program of balance and flexibility exercises. Based on a review of literature of resistance training for patients with Parkinson's disease, a low resistance intensity was employed. The resistance training targeted the major muscle groups of the lower extremities. Therapy was scheduled twice a week to avoid problems with fatigue. **Outcomes**: Initial physical therapy evaluation noted a Functional Reach of 8", Timed Up and Go score of 20 seconds and a Tinetti score for gait and balance of 23/28. At the completion of therapy the patient was noted to have a Functional Reach of 12", a Timed Up and Go score of 14 seconds and a Tinetti score for gait and balance of 25/28. The patient was also able to perform Single Leg Stance for 10 seconds when previously unable. **Discussion:** The addition of resistance training to an existing program of balance and flexibility exercises did not cause any adverse effects and appears to have led to improvements in balance and functional ability. Further investigation of resistance training for patients with MSA is warranted in order to determine optimal parameters for the intervention.

SARCOPENIA: A COMMON PATHOGEN LEADING TO PHYSICAL FRAILTY IN AGING AND CHRONIC DISEASE. T.N. Frimel, H.H. Host, D.R. Sinacore, Physical Therapy, Washington University, St. Louis, MO; D.T. Villareal, E.F. Binder, Internal Medicine, Washington University, St. Louis, MO.

Purpose/Hypothesis: Sarcopenia is an age-related decline in skeletal muscle mass and strength and a major cause of decreased physical function contributing to frailty in the elderly. Sarcopenia is a prominent impairment in a variety of chronic diseases seen by physical therapists. The purpose of this study was to determine the impact of lower extremity (LE) muscle strength (sarcopenia) and its relationship to physical frailty in diabetic neuropathic (DN), elderly obese (EO), and elderly non-obese (EN) individuals. **Subjects**: Fifty-three DN subjects (37 men, 16 women; age 54±10 years, mean BMI= 32 ± 6; duration of DM 16±11years); 29 EO subjects (12 men, 17 women, age 70±4 years, BMI = 38±5); and 95 EN subjects (25 men, 70 women, age 80±7 years, BMI = 25±6) were studied. **Materials/Methods**: All impairment measurements were collected during a single session. The 9-item physical performance test (PPT) was used as an objective assessment of physical frailty. Peak torque of the quadriceps, hamstrings, plantar flexors, and dorsiflexors was assessed at 3 speeds with an isokinetic dynamometer to determine muscle strength and severity of sarcopenia. Mean ± sd were calculated for each cohort and compared using one-way ANOVA. Univariate and multivariate (age, BMI, and peak torque of the quadriceps, hamstring, dorsiflexors, and plantarflexors) regression analyses were performed for the entire sample (pooled) and in each cohort separately to determine the best predictors of physical frailty (total PPT score). **Results:** The mean PPT score was 26±7 in the DN group, 27±3 in the EO group and 22±6 in the EN group. (F=15.3, p<0.00). Regression analyses demonstrated age, BMI, quadriceps and dorsiflexor strength best predict PPT in DN group (r2=0.501, p<0.03), while quadriceps, dorsiflexor and plantar flexor strength best predict PPT in EN group (r2=0.304, p<0.04). In the EO group, BMI best predicts PPT (r2=0.146, p<0.05), while strength of LE muscle groups did not predict total PPT score. **Conclusions**:

Sarcopenia is a common pathogen that occurs with aging and predicts physical frailty accompanying several chronic diseases including diabetes mellitus with peripheral neuropathy and to a lesser extent obesity. The results of this study demonstrate that BMI and excess body fatness (obesity) may contribute to physical frailty in EO participants more than LE muscle strength. Our results also suggest that strength assessment of several muscle groups of the LEs predict physical frailty to a larger extent than a single muscle group for individuals with generalized sarcopenia. **Clinical Relevance**: Our study suggests there are likely many contributors to physical frailty among individuals seen routinely by physical therapists. A more comprehensive and thorough understanding of the role of sarcopenia in physical frailty may help determine optimal rehabilitation strategies in the amelioration of sarcopenic skeletal muscles.

Supported by the NIH T32 HD 007434, RO1 DK 59224, RO1 AG 025501.

THE EFFECTIVENESS OF A COMMUNITY-BASED MULIFACTORIAL INTERVENTION ON FALLS AND FALL RISK FACTORS IN COMMUNITY LIVING OLDER ADULTS: A RANDOMIZED, CONTROLLED TRIAL. A. Shumway-Cook, Rehabilitation Medicine, University of Washington, Seattle, WA; I. Silver, L. Mary, Injury and Violence Prevention, Washington State Department of Health, Olympia , WA; S. York, Northwest Orthopaedic Institute, Tacoma, WA; P. Cummings, T. Koepsell, Epidemiology, University of Washington, Seattle, WA.

Purpose/Hypothesis: Falls represent a significant health risk to older adults, with one in three community living elders falling each year. Falls are associated with increased risk for mortality, morbidity and institutionalization. This study used a randomized controlled clinical trial to evaluate the effectiveness of a community-based intervention on falls and risk factors (balance, lower extremity strength and mobility) in community-living older adults. **Subjects**: 453 sedentary adults age 65 years or older living in the community. **Materials/Methods**: A randomized, controlled trial of 12 months duration examined the effects of a multifaceted intervention, which included 3 times a week group exercise program, 6 hours of fall prevention education, and a comprehensive falls risk assessment with results sent to primary health care provider. Control group received written materials on falls prevention. Primary outcome was fall rates calculated from self-reported falls reported monthly for 12 months. Secondary outcomes were tests of lower extremity strength (repeated Chair Stand), balance (Berg Balance Test), and mobility (Timed Up and Go) measured prior to and following the 12-month intervention. **Results**: Twelve month follow-up was completed on 95% of participants. Intent to treat analysis found the incidence rate of falls was 25% less among those in intervention group compared with control group (1.77 vs. 1.33 falls/person-year, rate ratio 0.75, 95% CI 0.52 to 1.09). Significant changes were found on the Berg Balance Test (adjusted mean difference +1.5 points, 95% CI 0.8 to 2.3), the Chair Stand Test (adjusted mean difference +1.2, 95% 0.6 to 1.9), and the Timed Up and Go Test (adjusted mean difference 0.7, 95% CI -1.1 to -0.2). **Conclusions**: Community-based multifaceted intervention was effective in improving balance, mobility, and leg strength, known fall risk factors. The incidence of falls was less in the intervention group, but did not reach significance. **Clinical Relevance**: A community based multifaceted intervention that includes exercise is an effective approach to improving risk factors for falls, however further research is needed to determine the optimal dose of such an intervention in order to effectively reduce falls in community living elders.

THE RELATIONSHIP BETWEEN IMPAIRMENTS IN MUSCLE PERFORMANCE, FUNCTIONAL LIMITATIONS, AND DISABILITY IN OLDER ADULTS. M.L. Puthoff, Physical Therapy Department, St. Ambrose University, Davenport, IA; D.H. Nielsen, Graduate Program in Physical Therapy and Rehabilitation Science, University of Iowa, Iowa City, IA.

Purpose/Hypothesis: Throughout the aging process, individuals demonstrate an overall decline in muscle mass with a specific atrophy of Type II muscle fibers. This generalized loss of skeletal muscle mass has been termed sarcopenia and is considered a major factor leading to the development of impairments in muscle performance (strength, power, and endurance) for older adults. According to the disablement model, impairments can directly lead to functional limitations (FL) which can then lead to disability. The purpose of this study was to examine how impairments in lower extremity strength, power, and endurance are related to FL and disability in community dwelling older adults. **Subjects**: Thirty community dwelling older adults (mean age = 77.3 (7.0), 25 females, 5 males) with self-reported mild to moderate FL were recruited to participate in this study. **Materials/Methods**: This study used a cross sectional design and data were collected over three sessions. The Keiser 420 Leg Press was used to assess impairments in lower extremity muscle performance. Strength was measured through one repetition maximum (1-RM). Power was assessed at 40, 50, 60, 70, 80, and 90% of 1-RM. Overall peak power, power at 40% 1-RM, and power at 90% 1-RM were used as power outcome measures to allow the examination of power across a range of relative intensities. To assess endurance, subjects completed as many repetitions as possible at 60% of 1-RM and were instructed to complete each contraction at maximal contraction velocity. Three outcome measures for endurance were used: the number of repetitions completed, power decline across the first ten repetitions, and the power decline across the first fifteen repetitions. Functional limitations were classified through the Short Physical Performance Battery, the Six-Minute Walk Test, and the Late Life Function and Disability Index (LLFDI) Functional Limitation Component. Disability was measured through the LLFDI Disability Component Limitation Category. Regression analysis was used to examine the direct effect between impairments in muscle performance and FL.

Mediation analysis was used to examine the indirect effect of impairments on disability. **Results:** Strength and power were found to be directly related to FL and indirectly related to disability in community dwelling older adults. Peak power had the largest influence on most FL and disability. An exception was that power at 90% 1-RM explained more of the variance than peak power in high intensity activities, such as sit to stand performance. The results of this study did not support a relationship of impairments in endurance to FL or disability. **Conclusions**: Lower extremity strength and power are related to FL and disability in older adults. Power production at a range of relative intensities, not just peak power, is vital for older adults. **Clinical Relevance**: Community dwelling older adults should focus on maintaining and improving lower extremity strength and power across a range of relative intensities in order to decrease FL and disability.

FACTORS THAT INFLUENCE THE DECISION MAKING PROCESS OF CLINICIANS IN CHOOSING A BALANCE ASSESSMENT METHOD. P.Q. McGinnis, Physical Therapy Program, Richard Stockton College of NJ, Pomona, NJ; L.M. Hack, K. Nixon-Cave, S.L. Michlovitz, Physical Therapy, Temple University, Philadelphia, PA.

Purpose/Hypothesis: The APTA has identified evidence-based practice as a key component of Vision 2020. The professional literature provides a variety of balance assessment methods therapists could utilize during examination of patients with balance deficits. However, little evidence is available that explicates the clinical decision making process of therapists in selecting assessment approaches for specific patients. The aims of this qualitative study were to 1) understand the selection and utilization of balance assessment methods from the perspective of the clinician, 2) ascertain what therapists studied knew about available options and explore why they selected the methods used, and 3) determine whether practice choices matched recommendations from the literature. **Subjects**: Purposeful sampling was utilized to select 11 clinicians as participants (6 from outpatient, 5 from inpatient rehab settings). Clinical experience ranged from 4-18 years. **Materials/Methods**: Data sources included repeated interviews, analysis of balance assessment methods used, and expert opinion. Credibility of the findings was established by use of low inference data, member check, and triangulation among participants and data sources. Inter rater reliability of the coding scheme with an outside reader yielded .79 kappa coefficient, or substantial agreement. Qualitative data analysis software was utilized through a process of open and axial coding, and thematic analysis. **Results**: Several themes emerged from the data. Therapists used practical knowledge drawn from experience to guide assessment decisions. Observation of patients' movement was the primary assessment and diagnostic tool. The perceived value of information gathered from various assessment approaches mattered more than testing time, and the primary advantage of using standardized balance tests was providing numeric data for documentation purposes. Among participants studied, the influence of the literature in guiding assessment decisions was limited. A Three Stage Model of Balance Assessment Decision Making, derived from the data, depicts both the decision making process, and reasons influencing therapists' choices. At times, therapists used standardized balance tests in a manner consistent with recommendations from the literature, but they also used them for a variety of other purposes. Participants also used a wide range of assessment approaches based on observation and description of movement that were not supported by research literature or expert panel recommendations. **Conclusions**: In the complex and busy nature of clinical practice, therapists gathered data that they considered meaningful during patient examination. Clinical practice choices during examination of patients with balance deficits matched recommendations from the literature at times, but often differed. **Clinical Relevance**: If the goal of the profession is to foster evidence-based practice, the practical knowledge and perceived values of clinicians must be integrated with findings from research literature.

VALUES OF STANCE TIME VARIABILITY RELATED TO MOBILITY DISABILITY. J.S. Brach, J.M. VanSwearingen, Physical Therapy, University of Pittsburgh, Pittsburgh, PA; S.A. Studenski, S. Perera, Geriatric Medicine, University of Pittsburgh, Pittsburgh, PA; A.B. Newman, Epidemiology, University of Pittsburgh, Pittsburgh, PA.

Purpose/Hypothesis: Greater stance time variability (STV) is related to incident mobility disability independent of gait speed. We wished to confirm this association and determine the magnitude of STV that potentially discriminates mobility disability in a sample of older adults diverse in gait speed and in a sub-sample with normal gait speed. **Subjects**: This cross-sectional study included 544 older adults (mean age=79.4; 39% men; 23% black) of the Cardiovascular Health Study from the Pittsburgh site. **Materials/Methods**: Stance time, in milliseconds (ms), was determined from 2 passes on a 4-meter computerized walkway at self-selected walking speed, and STV was defined as the standard deviation (SD) from approximately 12 individual steps. Mobility disability was defined as self-reported difficulty walking a half mile. A t-test was used to compare STV between individuals with and without mobility disability. Receiver operating characteristic (ROC) curves were plotted to determine an optimal cutoff value for stance time variability, and the area under the ROC curve was computed. Analyses were repeated in a subset with gait speed ≥ 1.0 meters/second. **Results**: Individuals without mobility disability (n= 419; mean STV=35.5 ms; SD=17.6 ms) were less variable in stance time than individuals with mobility disability (n=125; mean STV=51.2 ms; SD=31.1; $p < 0.001$). A STV≥36.5 ms has 66% sensitivity and 63% specificity for identifying mobility disability. Area under the ROC curve was 0.696. In those who walk

faster than 1.0 meters/second, STV≥30.5 ms has 60% sensitivity and 62% specificity for identifying mobility disability. Area under the ROC curve was 0.618. **Conclusions:** Greater STV is associated with mobility disability in community-dwelling older adults. **Clinical Relevance**: A value of STV≥36.5 ms, is a potentially useful clinical indicator of mobility disability in older adults. In those with near normal walking speed (gait speed ≥ 1.0 meters/second) a lower threshold value of STV (≥30.5 ms) may be more appropriate for identifying disability.

ISSUES OF PARTICIPATION AND PERCEPTION OF BALANCE CONTROL IN PATIENTS WITH PARKINSON'S DISEASE. S. Romero, K.E. Light, Physical Therapy, University of Florida, Gainesville, FL; P. Nicole, Geriatric Gait and Balance Disorders Clinic, Malcom Randall Veteran's Affairs Hospital, Gainesville, FL.

Purpose/Hypothesis: Parkinson's Disease (PD) is a movement disorder that leads to balance and movement control difficulty and resultant falls. Individuals with PD often appear fatigued and lacking in motivation to participate in activities. The purpose of this study was to explore differences in endurance, strength, perception of activities and perception of balance control between those fallers seen in a Geriatric Gait and Balance Disorders clinic with PD and those without PD. **Subjects**: We performed a retrospective review of 355 charts from patients referred to the Geriatric Gait and Balance Disorders Clinic. Participants were referred to this clinic because of problems resulting in falls. Charts were randomly selected from a pool of over one thousand and divided into two groups. Group one consisted of subject charts with a primary diagnosis of Parkinson's disease. Group two included the rest of the charts with individuals referred to the clinic for multiple reasons. Individuals with cerebral-vascular conditions and other cognitive disorders were excluded from this review. **Materials/Methods**: Individuals participating in the Gait and Balance clinic receive a comprehensive evaluation before, during and after completion of the recommended training program. This evaluation consists of multiple assessment tools to explore physical and cognitive aspects associated with falls. For the purpose of this study we reviewed results from the MOS-36 survey, the Falls Efficacy Scale, the Frenchay activities index, the 2-minute walk test, and dynamometry measurements of ankle dorsi-flexion, ankle plantar-flexion, knee extension, and hip abduction. Independent samples t-tests were used to compare both groups. Significance levels were established at 5% ($p<.05$). **Results:** Individuals with Parkinson's Disease did not differ significantly from those without PD in tests of strength and endurance. Independent sample t-tests revealed no significant differences between groups in the 2-minute walk test ($p=.13$) and strength measurements (all measurements $p>.05$). The two groups were significantly different in the Falls-Efficacy Scale ($p=.02$). Inspection of the two group means indicate that the PD group scored significantly lower (60.2) than the Non-PD group (70.1). This difference was not seen in the Frenchay Activities Index ($p=.12$) or MOS 36 Index ($p=.14$). **Conclusions:** Results of this study indicate that fallers with PD and those without PD are similar in endurance, strength, perception of physical limitations and IADLs. Clients with PD scored significantly lower in their confidence for balance control. A "floor" effect is possible when you use the MOS 36 and Frenchay Activity Index in frail elders, and we plan to explore a different method of activity analysis in the future. **Clinical Relevance**: Clients with PD who have significant falling problems demonstrate less confidence in their balance control than other clients who have falling problems. The low self-efficacy could impact motivation and interest in exercise and activities.

CLASSIFYING GAIT PATTERNS OF OLDER ADULTS BY MOVEMENT CONTROL AND BIOMECHANICAL FACTORS: VALIDATION BY GAIT AND PHYSICAL PERFORMANCE MEASURES. W.W. Huang, J. VanSwearingen, J. Brach, Physical Therapy, University of Pittsburgh, Pittsburgh, PA; S. Perera, S. Studenski, Geriatric Medicine, University of Pittsburgh, Pittsburgh, PA.

Purpose/Hypothesis: While gait patterns of older adults with mobility problems vary, the patterns are rarely used to plan interventions. The purpose of this study was to establish concurrent validity of a clinically useful classification system using gait and physical performance measures. **Subjects**: Community-dwelling male veterans (n=106; mean age, 76; SD, 7.1; range, 63-97 years) referred for mobility problems were videotaped for evaluation. All participants were independent in ambulation with a straight cane or no assistive device. **Materials/Methods**: All participants were videotaped for evaluation. We classified gait patterns using structured clinical observation and along movement control factors (consistent, inconsistent) and biomechanical factors (posture: usual, flexed, extended, crouched). Pairwise comparisons across various groups were performed to validate the gait classification using gait parameters (gait speed, step length, width and variability), lower extremity range of motion and muscle strength, physical function in ADL (Physical Performance Test, PPT) and gait abnormalities (GARS-M). **Results**: Consistent and inconsistent groups were different in gait speed (0.66 and 0.49m/s, respectively; $p=0.003$), step length (0.46 and 0.38m; $p=0.008$), step length variability (7.47% and 12.74%; $p=0.043$), the PPT (15.80 and 11.73; $p<0.001$) and GARS-M (5.83 and 10.66; $p<0.001$). Within both consistent and inconsistent groups, four groups defined by postural patterns, also differed in gait speed, step length, PPT and GARS-M scores ($p<.05$). **Conclusions:** Gait pattern classification based on movement control and biomechanical factors has good concurrent validity with respect to gait and physical performance measures of mobility. **Clinical Relevance**: The variability and postures determined by observation of gait by the therapists can be used to quickly identify and classify older adults with mobility problems in clinical set-

tings, allowing for possible targeted interventions for specific gait deficits.

PROGRESSIVE RESISTANCE TRAINING IMPROVES MUSCLE STRENGTH BUT NOT MASS IN FRAIL ELDERLY SUBJECTS AFTER HIP FRACTURE. H.H. Host, D.R. Sinacore, K.L. Bohnert, M. Brown, Program in Physical Therapy, Washington University, St. Louis, MO; E.F. Binder, Internal Medicine, Washington University, St. Louis, MO.

Purpose/Hypothesis: Sarcopenia is the age-related decline in muscle strength and mass that often contributes to physical frailty. High intensity progressive resistance training (PRT) has been used in the rehabilitation after hip fracture repair to increase muscle strength and improve physical functioning. We determined the changes in sarcopenia (upper and lower extremity muscle strength & lean body mass) and physical frailty in response to high-intensity PRT in elderly subjects after hip fracture repair. **Subjects**: Twenty-two women (age 80±1 yrs, BMI=23±1 kg/m2) and 9 men (77±2 yrs, BMI=26±2 kg/m2) were studied an average of 12±4 wks after repair of their hip fracture. All subjects had completed a traditional rehabilitation program following fracture repair. Before PRT, subjects had a mean score = 27±1 (max= 36) on the 9-item physical performance test (PPT). **Materials/Methods:** Subjects participated in 3 mos of light resistance/ stretching exercises followed by 3 mos of PRT. PPT score, total body dual-energy x-ray absorptiometry (DXA) and 1-repetition maximum (1RM) in leg press (LP), knee extension (KE), knee flexion (KF), biceps curl (BC), seated row (SR) and bench press (BP), were measured pre- & post-PRT. PRT intensity was set initially at 65% of 1-RM with 1-2 sets of 6-8 reps for each exercise. By 4 wks, subjects' goal was 3 sets of 8-12 reps at 85-100% of their initial 1-RM. 1-RMs were repeated at 6 wks (18 sessions) to progress each subject's exercise intensity. Means ± SE of the pre- & post-training differences were compared using paired t-tests; alpha level set at $p<0.05$. The PRT intensity was expressed as 1-RM, a percentage of initial 1-RM, and the volume (average wt lifted in final week of PRT X average number of reps). Pearson's correlation coefficient was used to assess the relationship between training intensity and improvements in strength and functional performance. **Results:** Throughout PRT, subjects exercised at the following intensities: LP 78±5%, KE 84±5%, KF 82±3%, BC 80±11%, SR 85±5%, BP 67±3% of initial 1-RM. With this training intensity, subjects increased LP 37±6% ($p<0.01$), KE 72±10% ($p<0.01$), KF 20±4%, BC 51±23%, SR 40± 7%, and BP 26±4%. Men increased BC from 30±10 to 59±10 lbs; 144%, $p=0.06$; while women increased SR from 43±5 to 57±4 lbs; 33%, $p<0.05$. Despite increases in muscle strength, there was no change in total LBM, UE or LE lean mass by DXA. PPT score improved from 27±1 to 30±1 (11%, $p<0.05$). We observed significant correlations between LE strength and PPT (KE volume vs. PPT & LP 1-RM vs. PPT) but not between UE strength and PPT. **Conclusions:** Frail, elderly subjects, post hip-fracture achieve large gains in strength & physical function after 3 mo of high-intensity PRT, despite no observable changes in total or limb LBM. **Clinical Relevance:** Our results confirm that frail elderly patients after hip fracture can improve muscle strength with high intensity PRT however, the training induced adaptations do not result in observable increases in total body or limb LBM in response to the PRT program performed.

THE IMPACT OF HEALTH AND BALANCE PERCEPTION, FALL HISTORY, AND BALANCE PERFORMANCE ON WALKING ACTIVITY IN OLDER ADULTS. J.E. Berlin, J. Brach, Physical Therapy, University of Pittsburgh, Pittsburgh, PA; A. Newman, Epidemiology, University of Pittsburgh, Pittsburgh, PA; S. Studenski, Geriatric Medicine, University of Pittsburgh, Pittsburgh, PA.

Purpose/Hypothesis: The benefits of a physically active lifestyle decreasing the risk of morbidity and mortality are well demonstrated. Disagreement currently exists regarding the contribution of health and balance perception, fall history, and balance performance to physical activity in older adults. Our purpose was to examine the impact of health and balance perception, fall history, and balance performance on walking activity in community dwelling older adults. We hypothesize that perception will be a stronger indicator of walking activity than fall history or balance performance. **Subjects**: Participants for this cross sectional analysis included 1712 community dwelling older adults [60 % female, mean age 78.9 (4.03), 85% white, mean gait speed 0.91 (.24) m/sec] from the Cardiovascular Health Study. **Materials/Methods**: Perception of health (excellent/ very good/ good or fair/ poor) and balance (poor or not poor) was obtained by self report. Self reported falls in the last year (fall history), balance performance (ability to tandem stand for 10 seconds), and walking activity (self reported number of blocks walked outside the home in the past week) were recorded. Health and balance perception were correlated; therefore, they were combined into a composite perception score (poor versus good perception). A three way between subjects ANCOVA was used to examine the association and interaction between perception, fall history, and performance on walking activity controlling for age, race and gender. **Results:** The results of the ANCOVA revealed significant main effects for perception but not for fall history or balance performance on walking activity. Participants who had poor perception on average walked less blocks per week than those with good perception (16.42 and 31.73 blocks respectively; $F= 14.35$, $p<0.001$). Participants who had a history of falls did not differ in blocks walked per week from those who had not fallen (21.41 and 26.74 blocks respectively; $F= 1.76$, $p = 0.185$). Also, participants who could not tandem stand reported similar levels of walking activity as those who could tandem stand (20.94 and 27.21 blocks respectively; $F= 2.39$, $p = 0.122$). Interaction effects were not significant. **Conclusions:** Perception of both health and balance are associated with walking activity more so than fall history or balance performance. **Clinical Relevance**: Perception may be a greater barrier than performance or fall

history to walking activity in community-dwelling older adults. These findings emphasize the importance of assessing the patient's perception of their health and balance.

ONSET OF MOBILITY DISABILITY IN AN 81 YEAR OLD WOMAN ON NEUROTOXIC CHEMOTHERAPY. E.S. Hile, Physical Therapy, University of Pittsburgh, Pittsburgh, PA; S. Perera, S.A. Studenski, Geriatric Medicine, University of Pittsburgh, Pittsburgh, PA.

Background & Purpose: While up to 80% of certain cancers occur in those over the age of 65, older individuals are vastly underrepresented in cancer trials, so little is known about how they respond to cancer treatments. The use of taxane-based therapies to treat cancer is common in older adults, and these drugs are known to be neurotoxic. What is not known is how neurotoxicity may affect older adults with cancer differently than the younger population in which it is typically studied. Acute neuropathy may have greatest functional impact for the older adult with cancer, many of whom have age-related declines in visual, vestibular, and peripheral nerve systems at baseline, struggling to maintain their balance and mobility with limited physiologic resources even before chemotherapy begins. We describe the case of an older female with no reported mobility disability at baseline, but dramatic deterioration in mobility function over 12 weeks of neurotoxic chemotherapy. The need to use standardized measures to closely monitor balance and mobility in older adults on chemotherapy is highlighted, along with the need to educate medical oncology teams about functional concerns of older individuals and intervention options for functional decline. **Case Description:** An 81 year old active, independent female with breast cancer was enrolled in a 12 week observational prospective study of daily activity in older adults on cancer therapies. She had completed 3 cycles of adriamycin/ cytoxan combination therapy at the time of study enrollment. Baseline Short Physical Performance Battery (SPPB) summary score was 10/12, with subscores of balance (4/4 or 10 s tandem stand), timed walk (4/4 or 1.2 m/s) and 5 timed chair stands (2/4 or 15.8 s). She reported no difficulty climbing stairs or walking at baseline. Over 12 weeks, she received her final dose of adriamycin/cytoxan and progressed to paclitaxel therapy. **Outcomes:** Dose-limiting neurotoxicity was recognized by the oncologist before her 12 week study follow-up, prematurely ending her paclitaxel regimen. At 12 weeks, her gait had deteriorated, and she reported difficulty walking, climbing stairs, and shopping. SPPB summary score dropped to 5/12, with declines in every subscale (balance 1/4 or 3.6 s semitandem stand, timed walk 3/4 or 0.74 m/s, and timed chair stands 1/4 or 16.9 s). She reported 22 days of ADL or mobility difficulty over the 12 weeks, but had not been referred for mobility related interventions. **Discussion:** Older adults receiving neurotoxic chemotherapies, even those without baseline functional limitations or obvious fall risk, may be highly susceptible to the development of mobility and balance deficits, so standardized measures of mobility should be used more routinely in this population. In addition, the medical oncology team must be educated in the unique functional concerns of the older adult with cancer, and in options for intervention to minimize risk for falls and loss of independence. Options include referral to a physical therapist or transdisciplinary geriatric assessment team.

MUSCLE PERFORMANCE CHARACTERISTICS OF HIP AND ANKLE EXTENSORS AND THEIR RELATIONSHIP TO GAIT IN PERSONS AFTER HIP FRACTURE. K.K. Mangione, S. Guss, R. Reifsnyder, G. Jeblonski, M. Konersman, A. Franks, M. Eastlack, R. Craik, Physical Therapy, Arcadia University, Glenside, PA.

Purpose/Hypothesis: Hip fracture adversely affects muscle performance and function. Muscle performance has been described as peak isometric force or isokinetic torque. However, the total force generated (impulse) during the initiation of contraction and the speed at which a person can generate the force (rate of force development (RFD)) may be as important as the peak values typically reported. The purpose of this report is to examine muscle performance characteristics (impulse, RFD, and peak torque) of the hip and ankle extensors and their relationship to walking speed, a measure of functional performance, in a sample of elders 6 months post hip fracture. **Subjects**: Twenty six patients (81 ± 6 yrs) who had completed all traditional, medicare-reimbursed rehabilitation were included in this study. They had an average of 4 comorbidities and were taking 5.5 medications. BMI was 27.4 ± 3.7 kg/m2. **Materials/Methods**: Measures included free and fast gait speed using the Gait Mat II; peak isometric torque; rate of force development; and impulse of the hip and ankle extensors using the Kincom and labview software. **Results:** Subjects produced significantly less isometric torque and did so more slowly on the involved side as compared to the non-fractured side. Comparing involved to uninvolved hip muscle performance characteristics, hip extensor impulse at 100 msec was 1.57 vs 1.83 N*m*sec and 4.44 vs 5.76 N*m*sec at 200 msec; hip extensor RFD at 100 msec was 199.1 vs 263.6 N*m*sec and 141.5 vs 200.7 N*m*sec at 200 msec; and hip extensor peak torque 62.5 vs 81.8 N*m. Comparing involved and uninvolved ankle muscle performance characteristics, ankle plantarflexion impulse at 100 msec was 0.96 vs 1.07 N*m*sec and 2.26 and 2.58 N*m*sec at 200 msec; ankle plantarflexion RFD at 100 msec was 62.8 vs 88.8 N*m/sec and 49.7 vs 63.6 N*m/sec at 200 msec; and ankle plantarflexion peak torque was 21.2 vs 24.3 N*m. Participants also walked more slowly in response to preferred (usual) speed (0.69 ± 0.18 m/sec) and fast speed commands (0.99 ± 0.27 m/sec) than age-matched peers. The relationships between muscle performance characteristics and gait speed were weak, at best(r values = 0.02-0.50). **Conclusions:** Muscle performance characteristics of the hip and ankle muscles have not been reported in persons after hip fracture. The results of this study suggest that the entire LE is impaired after traditional rehabilitation has stopped. **Clinical Relevance:** Exercise training may

need to include rapid force production for the LE extensor muscle groups. It is not clear if gait speed is related to impulse or rate of force development in this small sample of elders post hip fracture.

USE OF A RECUMBENT STEPPER TO OBTAIN PEAK OXYGEN CONSUMPTION IN PEOPLE WITH STROKE. S. Billinger, P.M. Kluding, B.Y. Tseng, Dept of Physical Therapy and Rehab Sciences, University of Kansas Medical Center, Kansas City , KS.

Purpose/Hypothesis: People with stroke have decreased cardiorespiratory fitness. Aerobic exercise improves functional mobility, increases participation in leisure activities, and decreases risk factors associated with heart disease and stroke. Assessment of peak oxygen consumption (VO2 peak) using traditional modes of testing such as treadmill or cycle ergometer may prove to be difficult in a variety of populations but more specifically individuals with stroke. Balance deficits, gait impairments, and decreased coordination may limit exercise test performance on traditional modes (ie treadmill, cycle ergometer), which may be less accurate for exercise prescription. In our previous work, 22 healthy adults were recruited to participate in a study comparing the total body recumbent stepper exercise test (TBRS-XT) to the Bruce protocol using a treadmill. The results of that study indicated a strong correlation between the TBRS-XT and Bruce protocol exercise tests. Based on those results in a healthy population, the purpose of this study was to determine if the TBRS-XT is a feasible exercise test protocol to obtain VO2 peak (ml*kg-1*min-1) for individuals with chronic stroke. **Subjects**: Seven adults (4 males, 3 females; 63.0 ± 11.0 years) with mild to severe stroke (Fugl-Meyer (FM) scores ranged 13-34 for lower extremity) participated in the study. Subjects were an average of 51±38 months post-stroke. **Materials/Methods**: Subjects participated in two exercise tests on separate days in alternating order to obtain VO2 peak using open circuit spirometry. One exercise test was performed using the TBRS-XT while a cycle ergometer was used for the other exercise test. Data was analyzed using Pearson correlation coefficient and paired t-tests with alpha set at 0.05. **Results:** No significant differences were observed between the TBRS-XT and cycle ergometer for VO2 peak (15.2 ± 5.9 vs 15.3 ± 4.9 ml * kg-1 * min-1), peak heart rate (138.3 ± 23.8 vs 141.2 ± 19.8 beats *min-1), respiratory exchange ratio (1.1 ± 0.1 vs 1.1 ± 0.1), and exercise time (11.9 ± 2.5 vs 11.9 ± 5.2 minutes). A moderate correlation (0.78) was observed between FM scores and VO2 peak values from the TBRS-XT. One subject (FM score = 18) was unable to perform the cycle ergometer exercise test but was able to complete the TBRS-XT to volitional fatigue. No adverse events were reported during the exercise tests. **Conclusions**: Data suggest that the TBRS-XT may be a safe, feasible and valid exercise test to obtain VO2 peak in people with stroke. **Clinical Relevance**: Use of the TBRS-XT allows clinicians to accurately prescribe aerobic exercise based on VO2 peak values for individuals post-stroke with mild to severe deficits as defined by FM scores.

POSTER PRESENTATIONS

A REDUCTION IN FUNCTIONAL LIMITATIONS AFTER RESUMING PHYSICAL THERAPY 17 WEEKS POST CVA: A CASE REPORT. H. McCarthy, Helen Porter Healthcare and Rehabilitation Center, Middlebury, VT.

Background & Purpose: Stroke, or cerebrovascular accident (CVA), is the number one cause of serious disability among adults in the United States. Generally, research has focused on the neurological and functional recovery that occurs within the first 12 to 20 weeks post CVA. This case report will show the increase in quality of life and decrease in functional limitations one patient experienced after resuming rehabilitative physical therapy 17 weeks post CVA. **Case Description**: The subject is an 80-year-old male who was living independently with his wife when he experienced a left middle cerebral artery infarct accompanied by subsequent right-sided weakness and neglect. His past medical history includes depression and hypercholesterolemia. Surgical intervention included left carotid endarterectomy 8 weeks post CVA, with no additional neurological deficits. He received physical therapy in an acute rehabilitation setting but was ultimately discharged to a long term care facility due to lack of progression 13 weeks post CVA. He was unable to transfer from his bed to a chair independently, unable to ambulate independently and, secondary to his poor strength, balance and safety awareness, was unable to leave the facility with his family. At 17 weeks post CVA he was transferred to an in-patient sub-acute rehabilitation facility where rehabilitative physical therapy was resumed. This patient's goals were to return home with his wife and ambulate independently. Primary physical therapy interventions included therapeutic exercise, transfer training, gait training, balance training and patient and family education. His balance was assessed using the Berg Balance Scale and his ambulation endurance was assessed using the 6-minute walk test. These interventions were provided primarily by the physical therapist for approximately 60 minutes each session, 5 days a week. **Outcomes**: After 11 weeks, the patient progressed from requiring assistance for all mobility to transferring and ambulating more than 200 feet independently with a hemi-walker. He made significant improvements in both the Berg Balance Scale and the 6-minute walk test. His strength, balance, and functional mobility had improved enough that he was able to return home with his wife and join her on various outings. **Discussion:** Little information has been published on the advantageous effects that physical therapy can have in the later months post CVA. The outcomes of this case report demonstrate the increase in quality of life and decrease in functional limitations one subject experienced after resuming rehabilitative physical therapy 17 weeks post CVA.

TEMPORAL AND SPATIAL CHARACTERISTICS OF DIVIDED-ATTENTION TASK GAIT PERFORMANCE IN COMMUNITY DWELLING OLDER ADULTS. G.F. Marchetti, Physical Therapy, Duquesne University, Pittsburgh, PA; J.M. Prendergast, Internal

Medicine, Mercy Hospital, Pittsburgh, PA; A.T. Fortunato, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, PA.

Purpose/Hypothesis: A decrease in the attentional resources of older adults may increase the risk for falls during walking tasks. The exact nature of gait changes that occur with a cognitive task has not been previously described. The purpose of this study was to identify temporal and spatial changes that occur with divided attention walking in a sample of community dwelling older adults. **Subjects**: 11 community-dwelling older adults mean age 72 years. **Materials/Methods**: Subjects performed 2 level gait trials at three conditions and two velocities (preferred and maximal): normal gait, cognitive-simple (walking/saying alphabet in order) and cognitive-complex (walking/saying alphabet every other letter) in a fixed order. Temporal and spatial gait parameters were measured using a GAITRite 12 foot instrumented walkway. Descriptive statistics for six walking conditions were obtained using the following parameters: velocity, cadence, double support time as percent of gait cycle (DS%), step length variability (coefficient of variation, CV), and gait stability ratio (GSR, cadence/velocity). Intertrial reliability for each parameter within each condition was determined using the intraclass correlation coefficient (ICC). **Results:** Mean preferred walking velocity for the sample was .97 m/sec (SD 24.9, .49-1.31) Intraclass correlation coefficients for gait velocity and step length 0.90 or greater for all six walking conditions. Lower ICCs (0.38-0.65) were found for cadence, left step length and DS% with maximum velocity normal gait. Group mean preferred gait velocity increased slightly with cognitive-simple walking and decreased under the cognitive complex condition. This pattern was demonstrated by 7 of the 11 subjects. Group mean maximum velocity deceased with both cognitive conditions. Preferred velocity decreased by 5% from normal to the cognitive-complex condition at preferred and 10% at maximum velocity. Similar patterns in gait parameters associated with increasing fall risk (step length variability, DS% and GSR) were seen across walking conditions. Side to side step length differential decreased in the cognitive-simple condition and increased in the cognitive complex condition compared to normal at preferred speed. **Conclusions**: Temporal and spatial gait parameters appear stable between successive trials within varying levels of cognitive distraction tasks. In several subjects, gait characteristics at preferred velocity actually improved when walking with a simple distraction task and decayed with a complex task. At maximal velocity, several gait parameters generally decayed compared with normal walking across both cognitive walking conditions. **Clinical Relevance**: As gait changes with distraction have been suggested as evidence of early cognitive decline, further investigation may be useful to identify early indications of increased fall risk and loss of functional independence. The nature of the association between gait parameter changes and cognitive function may help identify factors related to cognitive, postural control and functional decline.

COMPARISON OF CHANGES IN UPPER EXTREMITY STRENGTH, FUNCTION, AND BALANCE IN OLDER ADULTS WHO EXERCISE WITH THERA-BAND™ VS. BODYBLADE™.

M.R. Hinman, J.K. O'Connell, L. Graves, J. Maples, K. Staton, Physical Therapy, Hardin-Simmons University, Abilene, TX.

Purpose/Hypothesis: To compare changes in upper extremity strength, function, and standing balance in older adults who exercise for 4 weeks using either Theraband™ (TB) or a Bodyblade™ (BB). **Subjects**: Sixteen residents aged 80 to 93 were recruited from 2 assisted-living facilities. Eight subjects were assigned to each exercise group. **Materials/Methods**: A pre-test post-test experimental design compared measures of shoulder strength, grip strength, static balance, and upper extremity function within and between the 2 exercise groups. Shoulder and grip strength were measured with a handheld dynamometer, balance was measured as one-legged stance time (OLST), and function was measured using the Quick DASH™. Subjects performed the exercise protocols using the assigned device in their dominant hand while standing in both a wide and narrow stance. The BB group exercised by oscillating the blade with their arms held in flexion and abduction. Subjects in the TB group repetitively pulled the bands forward (flexion) and out to the side (abduction). During weeks 1 and 2 subjects performed each exercise in both stance positions for 30 seconds and progressed to 45 seconds during weeks 3 and 4. Subjects exercised 3 times a week with at least one day of rest between exercise sessions. A multivariate analysis of variance was used to compare changes in strength measures within subjects and between groups. OLST was compared with paired t-tests and DASH ratings were compared using a Wilcoxon signed-ranks test. All data were analyzed at the .05 alpha level using SPSS 14.0. **Results:** All participants demonstrated a significant overall improvement in upper extremity strength regardless of exercise group ($p=.013$). The univariate analyses indicated that these improvements were significant for shoulder flexion ($p<.001$) and abduction ($p=.013$) but not grip strength ($p=.126$). Strength changes between exercise groups were not significant. OLST did not change significantly in either exercise group. A greater number of subjects reported improved DASH scores in the TB group ($p=.045$) than in the BB group ($p=.306$). **Conclusions**: Assisted living residents who exercised with either TB or a BB experienced small (~1 lb) but significant improvements in shoulder strength. The extent of improvement was comparable between exercise groups, and neither group reported adverse effects. Although a greater percentage of TB subjects reported functional improvements (75% vs. 50% in BB group), most subjects had difficulty rating their everyday activities with the DASH; thus, the validity of these particular results may be questionable. The small sample and effect sizes may also have adversely affected the power of these data analyses. **Clinical Relevance**: A 4-week resistive exercise program using either a BB or TB can produce small gains in the arm strength of residents in assisted-living facilities but is unlikely to produce significant changes in balance or function.

Further study of this population using an exercise protocol of longer duration is recommended.

THE EFFECT OF A MODIFIED JAZZ DANCE CLASS ON BALANCE IN OLDER WOMEN. H. Wallmann, C. Gillis, Physical Therapy, University of Nevada, Las Vegas, Las Vegas, NV; P. Alpert, S. Miller, School of Nursing, University of Nevada, Las Vegas, Las Vegas, NV.

Purpose/Hypothesis: The purpose of this study was to assess the impact of age-appropriate jazz dance class instruction on balance for women utilizing dynamic posturography. **Subjects**: Fourteen healthy elderly women aged from 52 to 88 participated in the study. All were a sample of convenience of volunteers recruited from a Senior Dance Techniques course offered by the Department of Dance at the University of Nevada, Las Vegas. **Materials/Methods**: The subjects completed a 15-week jazz dance program in which the subjects attended one time per week for 50 minutes in duration. Baseline balance data were collected through the use of the Sensory Organization Test (SOT) as administered using the NeuroCom Smart® Balance Master System (Balance Master) during weeks 1 and 2 of the class. The second measurement was recorded between weeks 7 and 8 and the final measurement was taken after week 15 of the class. Means and standard deviations were calculated for the outcome variables. A repeated measures ANOVA was used to compare the means of each subjects' SOT composite equilibrium score over the 3 measurement time frames. The composite equilibrium score reflects the overall performance on the SOT and is the sum of all 6 conditions. Alpha levels were set at 0.05. **Results:** There was a statistically significant difference among the mean SOT composite equilibrium scores ($F(2,22) = 23.185$) for pre, mid, and post time intervals as follows: Pre= 67.333, SD= 10.430; Mid= 75.250, SD= 6.969; Post= 79.000, SD= 4.973, ($p<0.0005$). Pairwise (Bonferroni) post-hoc analyses revealed the following statistically significant findings for SOT composite equilibrium scores for the pre, mid, and post measurements: Pre-Mid ($p= 0.008$); Pre-Post ($p< 0.0005$); Mid-Post ($p= 0.033$). **Conclusions**: The results of this study suggest that administration of a jazz dance program as an alternative to a traditional exercise program is beneficial in improving balance as measured by the Balance Master. Future research should consider the comparison of different exercise or dance groups and larger sample sizes. **Clinical Relevance**: Many elderly may not have the opportunity or desire to perform an exercise-based program. Since many elderly experience a loss of stability, they seek to compensate by restricting their activity levels, thereby avoiding falling. However, given the social proclivity of elderly individuals, many do find dance as an attractive alternative to an exercise regimen. The findings from this study reveal that dance-based training is beneficial in improving balance, which may help to decrease fall risk.

STRENGTH AND SPEED TRAINING FOR ELDERS WITH MOBILITY DISABILITY. E.J. Protas, S. Tissier, Physical Therapy, UTMB, Galveston, TX.

Purpose/Hypothesis: The purpose of this study was to pilot test a function-focused exercise intervention consisting of strength and gait speed training in elders with reduced walking speed, decreased walking endurance, and functional impairment. **Subjects**: Twelve subjects, 77.2 years old (± 7.34), whose usual gait speed was <0.85 m/s, with walking endurance of < 305 m in 5-minutes, and who were functionally impaired. **Materials/Methods**: Subjects were tested for usual and fastest gait speed, 5-min walk distance, gait energy costs/meter walked, lower extremity muscle strength, timed step test and floor transfer, and the Short Physical Performance Battery pre-, after 6 and 12 weeks of training, and for follow-up. Subjects participated in a moderate intensity exercise intervention. The training occurred 3 times per week, 75 minutes per session for 3 months, and combined gait speed training, walking exercise, and functional strengthening. Data were analyzed using an analysis of variance with repeated measures for time and appropriate post-hoc comparisons. **Results:** The subjects demonstrated mean usual gait speeds (1.06 (± 0.15 m/s), endurance (359.3m ± 52.5), and functional ability (chair stands = 8.6s ±1.9; step test = 0.58steps/s ± 0.11; floor transfer = 0.071 transfers/s ± 0.017; Short Physical Performance Battery = 11.17 ± 0.13) that were within normal limits after 12 weeks of training. Fastest gait speed (1.58 ± 0.25) and muscle strength also improved significantly. Improvements were maintained during follow-up testing. **Conclusions:** This innovative 12 week intervention for frail, mobility disabled subjects led to improvements in walking, function and strength. **Clinical Relevance**: An appropriately targeted, task specific intervention can reduce or eliminate mobility disabilities in frail elders and, thus reduce the risk for falls, dependency and further functional decline.

GAIT EXAMINATION IN OLDER ADULTS: THE 8-FOOT VERSUS 20-FOOT WALK TESTS. R.A. Newton, Physical Therapy, Temple University, Philadelphia, PA; D. Klima, Physical Therapy, University of Maryland Eastern Shore, Princess Anne, MD; R.L. Cromwell, Physical Therapy, University of Texas Medical Branch, Galveston, TX.

Purpose/Hypothesis: Balance and mobility testing in the home or emergency department presents difficulties due to limited space. A shorter walkway yielding similar results would greatly expand the reliability of assessments in multiple locations. The purpose of our study was to determine to examine the compatibility of the 8-foot walk test with the 20-foot walk test. **Subjects**: 123 older adults (age = 80.6 ± 9.9 years) living in the home, assisted living and senior housing. **Materials/Methods**: Subjects completed a fall risk and health status questionnaire, then walked more than 30 feet on a level surface to obtain select gait measures: cadence (CAD), veloc-

ity (VEL), gait stability ratio (GSR). The start position for the 8- and 20-ft walk course was the same. Time and steps walked were recorded by two trained raters. Data from 118 subjects who completed both walks were analyzed using descriptive statistics and intraclass correlation coefficients (ICC). **Results**: Seventy percent rated their health as good or excellent; and 57% used an assistive device. Means (sd) for the 8-ft CAD = 1.79(±0.3); 8-ft VEL=0.83(±0.31); 8-ft GSR =2.38(±0.79). Means (sd) for the 20-ft CAD =1.76(±0.32); 20-ft VEL=0.87(±0.35); 20-ft GSR =2.26(±0.76).ICCs were moderate to excellent: ICC CAD = 0.792, 95%CI 0.700-0.855; ICC VEL = 0.912, 95%CI 0.873-0.939; ICC GSR = 0.941, 95%CI 0.915-0.959. **Conclusions**: When environmental constraints prohibit the use of the 20-foot walk test, the 8-foot walk test can be used to obtain cadence and velocity measures as well as the gait stability ratio. **Clinical Relevance**: The capability of selecting a shorter walk test to obtain gait characteristics provides therapists with a tool that can be used in multiple locations.

AGE-RELATED EFFECTS OF A COGNITIVE TASK ON FRONTAL PLANE STABILITY DURING NARROW-BASE WALKING. V.E. Kelly, R. Price, A. Shumway-Cook, Rehabilitation Medicine, University of Washington, Seattle, WA; M. Schrager, L. Ferrucci, Clinical Research Branch, National Institute on Aging, Baltimore, MD.

Purpose/Hypothesis: Age-related changes in frontal plane stability during gait are associated with impaired balance and increased fall risk in older adults. Clinically, tandem and narrow-base walking are used to assess dynamic gait stability. Adding a cognitive task to narrow-base walking (i.e. dual tasking) may further challenge stability, allowing identification of early balance deficits not detected under single task conditions. The purpose of this study is to examine age-related effects of a cognitive task on frontal plane stability during narrow-base walking in a population of healthy older adults. **Subjects**: Thirty subjects categorized by age: <65, 65-74, and 75 years, with 10 subjects per group. **Materials/Methods**: We examined spatiotemporal and center of mass (COM) parameters during narrow-base walking with and without a cognitive task. Statistical analyses included repeated measures ANOVA's (3 age groups x 2 task conditions). **Results:** The percent of step errors (i.e. steps outside the narrow-base corridor) did not differ significantly between groups (p=0.29) and was not affected by the performance of a secondary task (p=0.80). On average, about 16% of the steps were outside the narrow-base corridor. Average stride velocity (p<0.001) and step length (p<0.001) decreased with age, while mediolateral COM peak velocity (p<0.001) and displacement (p<0.05) increased. Addition of a cognitive task decreased stride velocity (p<0.001) and step length (p<0.05) for all age groups, but did not affect COM characteristics. **Conclusions:** Age-related changes in both velocity and frontal plane stability are evident during narrow-base gait. The addition of a secondary task affected stride velocity and stride length but did not affect mediolateral COM control in this group of healthy older adults. **Clinical Relevance**: The use of a cognitive task during balance and gait activities can help to identify individuals with increased fall risk. Further research is needed to determine if changes in narrow-base walking with versus without a secondary task can be used to predict future falls in older adults. If so, narrow-base walking under single and dual task conditions may be useful in identifying older adults with preclinical instability.

DIRECT AND INDIRECT EFFECTS OF COGNITIVE PROCESSING AND PHYSICAL FUNCTION ON DISABILITY IN OLDER ADULTS. L. Schrodt, Department of Physical Therapy, Western Carolina University, Cullowhee, NC; C. Giuliani, V. Mercer, Center for Human Movement Science, University of North Carolina at Chapel Hill, Chapel Hill, NC; J. Freburger , Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, Chapel Hill, NC; M. Hartman, Department of Psychology, University of North Carolina at Chapel Hill, Chapel Hill, NC; J. Busby-Whitehead, Program on Aging, University of North Carolina at Chapel Hill, Chapel Hill, NC.

Purpose/Hypothesis: Age-associated cognitive decline is associated with an increased risk of falls and poorer performance of mobility and daily living tasks in older adults. Understanding how cognitive processing contributes to everyday task performance is important for designing effective intervention programs for older adults. The purposes of this study were to examine: 1) the direct effect of cognitive processing on disability and the indirect effect mediated by physical function, and 2) if the relationship between physical function and disability is modified by cognitive processing. **Subjects**: Community dwelling older adult volunteers (N=155) from a continuing care retirement community and church congregation (mean age 81.2 ± 5.7 years, 71% female) who participated in a wellness assessment that included measures of cognitive processing, physical function, and disability. **Materials/Methods**: Cognitive processing, defined as performance on measures of attention and processing speed, was assessed with the Symbol Digit Modalities Test (SDMT) and the Trail Making Test Part B (TMTB). Raw SDMT and TMTB scores were transformed into z-scores to create a composite cognitive processing score. Physical function was assessed with the Physical Performance Test (PPT) and walking speed (WS). The SF-36 Physical Function Sub-scale (PF-10) assessed disability. Linear regression models were estimated to examine the direct and indirect relationships among cognitive processing, physical function, and disability. **Results:** Higher levels of cognitive processing were associated with higher levels of physical function and lower levels of disability (Pearson correlation coefficient range .42 to .60, p < .001). Cognitive processing explained approximately 14% of the variance in PF-10 (p <.001), primarily though indirect effects mediated by physical function. The indirect effect of

cognitive processing on PF-10, mediated by PPT or WS, was significant (p <.001); however, the direct effect of cognitive processing on PF-10 was not significant. The magnitude of the indirect effects of cognitive processing on PF-10 were similar with PPT or WS as the mediator. The relationship of PPT or walking speed to PF-10 was not modified by level of cognitive processing. **Conclusions:** The relationship between cognitive processing and disability is primarily mediated by physical function, illustrating the importance of cognitive processing on physical function and its indirect relationship to disability. Through this indirect path, decreased cognitive processing is associated with increased disability. **Clinical Relevance**: The results of this study support the importance of understanding how the combined effects of cognitive processing and physical function contribute to disability in older adults. Clinicians should consider cognitive processing abilities as they develop comprehensive treatment programs to improve physical function and independence in older adults.

PHYSICAL ACTIVITY COUNSELING BEHAVIORS OF PHYSICAL THERAPISTS. P. Page, LSU, Baton Rouge, LA.

Purpose/Hypothesis: The most important factor for participating in an exercise program is the advice of a healthcare professional (Ades et al. 1992). Unfortunately, less than 50% of physicians counsel their patients on exercise (Ades et al. 1992, Damush et al. 1999), and only 30% of patients with risk factors for disease receive advice (Ma et al. 2004). According to the Guide to Physical Therapist Practice (2001), physical therapists promote health, wellness, and fitness, including education and service provision. The purpose of this survey was to describe the reported counseling behavior of physical therapists and to identify barriers to physical activity (PA) counseling. **Subjects**: A total of 325 physical therapists completed the survey; 191 that reported patient exposure greater than 50% were included in this study. **Materials/Methods**: Physical therapists attending the annual Combined Sections Meeting completed a demographic and PA counseling survey (defined as activity outside of normal home exercise programs). Fitness level was assessed through body mass index (BMI) and self-reported physical activity levels (RAPA). Descriptive statistics and frequency analysis were evaluated. Stepwise linear regression was used to determine relationships between linear variables (age, experience, education level, BMI, RAPA) and counseling frequency, while ANOVA was used to determine relationships between non-linear variables (gender, setting, practice) in counseling frequency. **Results:** 77% of therapists reported counseling patients on physical activity more than 50% of the time, and 53% reported "always" counseling patients on physical activity. There was no relationship between any demographic or fitness variables and reported counseling, although amount of patient contact demonstrated a trend towards more counseling (p=.056). Although not statistically significant, the following trends were noted: Female therapists reported counseling more frequently than male therapists; the most experienced therapists reported the least amount of counseling, while the least experienced reported the most; and pediatric / school system therapists reported less counseling among the clinical groups. The most frequently reported barriers to physical activity counseling were: lack of time, lack of reimbursement, and lack of an in-house physical activity promotion program. **Conclusions**: As a profession, most physical therapists counsel patients on physical activity regardless of demographics at a level greater than the reported level of physician counseling. The barriers reported by physical therapists are similar to those reported by other healthcare providers. Future research should evaluate the impact of counseling on patients, as well as the effectiveness of methods to reduce counseling barriers in healthcare. **Clinical Relevance**: Physical therapists report moderate to high levels of physical activity counseling. By recognizing the same barriers reported in other providers, more effective programs may be developed to increase the counseling rate among all healthcare professionals.

AGE-RELATED DIFFERENCES IN SPATIOTEMPORAL MARKERS OF GAIT STABILITY DURING DUAL TASK WALKING. J.H. Hollman, F.M. Kovash, J.J. Kubik, R.A. Linbo, Program in Physical Therapy, Mayo School of Health Sciences, Rochester, MN.

Purpose/Hypothesis: Increased stride-to-stride variability during walking characterizes gait instability and predicts falling in older adults. Walking while performing cognitive tasks (dual task walking) is also associated with increased risk of falling. The purpose of the study was to examine whether gait velocity and variability in stride velocity differ in older adults compared with middle-aged and younger adults during normal and dual task walking conditions. **Subjects**: Sixty healthy older (n=20, mean age=81 years), middle-aged (n=20, mean age=48 years), and young adults (n=20, mean age=25 years) participated in the study. All subjects were independent ambulators classified as non-fallers. **Materials/Methods**: Subjects walked across an instrumented GAITRite® walkway under each of two conditions. In normal walking, subjects walked at self-selected speeds across the walkway. In dual task walking, subjects walked across the walkway while they verbally spelled 5-letter words backward. Three trials were completed in both conditions. Variability in stride velocity was quantified with the coefficient of variation (%CV). Errors in the cognitive task were quantified in the dual task condition. **Results:** Older subjects walked more slowly (p<.05) than did middle-aged and younger subjects in normal walking (122 ± 23, 148 ± 15 and 146 ± 18 cm/s, respectively) and in dual task walking (97 ± 22, 136 ± 16 and 135 ± 22 cm/s, respectively). Similarly, older subjects walked with greater variability in stride velocity (p<.05) than did middle-aged and younger subjects both in normal walking (6.1 ± 2.0, 3.6 ± 1.5 and 3.9 ± 2.3 %CV, respectively) and in dual task walking (9.0 ± 6.5, 5.1 ± 1.6 and 5.2 ± 3.0 %CV, respec-

tively). Across groups, gait velocity decreased ($p<.001$) and variability in stride velocity increased ($p=.001$) in dual task walking. Additionally, in older subjects only, an increase in the number of errors in the cognitive task was associated with reduced gait velocity ($r=-.487$; $p<.05$) and increased variability in stride velocity ($r=.534$; $p<.05$) during dual task walking. **Conclusions**: The gait changes observed in dual task walking characterize decreased gait stability and indicate that performing cognitively demanding tasks during walking has a destabilizing effect on gait that is most apparent in older people. Performing cognitively demanding tasks during walking may place older people at greater risk of falling. **Clinical Relevance**: It is important to recognize that attention-demanding tasks have a destabilizing effect on gait and that attentional processes are involved in walking. Recognizing the potential role of attention-demanding tasks on fall risk, one might instruct older individuals who are at risk of falls to avoid performing cognitive tasks while they are walking. In contrast, one may also recognize the utility of dual tasking and choose to engage the individual in cognitive activities while walking in an effort to improve the person's ability to perform dual tasks in a safe and functional manner.

STRENGTH AND FUNCTIONAL OUTCOMES IN UNILATERAL VERSUS SIMULTANEOUS BILATERAL TOTAL KNEE ARTHROPLASTY. S.C. Petterson, L. Snyder-Mackler, Physical Therapy Department, University of Delaware, Newark, DE.

Purpose/Hypothesis: Osteoarthritis (OA) is a leading cause of disability in the United States. 50% of individuals with radiographic evidence of knee OA have bilateral involvement and require total knee arthroplasty (TKA). Whether to recommend a staged procedure or a simultaneous, bilateral procedure remains a point of contention. A major concern surrounding the simultaneous procedure is higher risk of perioperative complications. To date, no studies have assessed differences in long-term strength and functional outcomes. **Purpose**: The purpose of the present study was to compare outcomes in individuals with primary knee OA undergoing simultaneous, bilateral TKA to those undergoing unilateral TKA. **Subjects**: 12 patients having unilateral TKA and 12 gender, age, and BMI-matched patients having simultaneous, bilateral TKA were tested preoperatively and 4, 7, 12, 24, and 52 weeks following TKA. Mean age was 62.0±6.7 years and mean BMI was 30.5±4.3 for both groups. **Materials/Methods**: All TKAs were performed using a medial parapatellar surgical approach and received 6 weeks of outpatient physical therapy 3 days per week. Self-reported function was measured using the mental and physical component summary scores of the SF-36(MCS and PCS, respectively) and the Activity of Daily Living Scale of the Knee Outcome Survey (KOS). Functional assessment included Timed Up and Go (TUG), Stair-Climbing Test (SCT), and Six-Minute Walk (6MW). A burst superimposition test was used to assess quadriceps strength (MVIC) and activation (CAR). A repeated measures ANOVA was used to assess differences in outcomes between groups over time. Preoperative measures were used as a covariate to account for inherent group differences. The level of significance was set at 0.05. **Results:** There were no significant differences in mean preoperative SF-36 or KOS scores, functional performance, quadriceps strength, or activation between the Unilateral and Bilateral Group. All assessment scores at 4, 7, 12, 24, and 52 weeks were similar between groups. At last follow-up (52 weeks), the Unilateral Group had a mean PCS score of 50.36±8.09, MCS score of 56.60±6.61, KOS score of 0.88±0.10, TUG of 7.72±2.71 seconds, SCT of 12.16±4.80 seconds, 6MW of 2000±420 feet, MVIC of 18.28±8.27 N/BMI, and CAR of 0.89±0.09. The Bilateral Group had a mean PCS score of 50.89±2.19, MCS score of 59.98±2.77, KOS score of 0.87±0.09, TUG of 6.44±0.87 seconds, SCT of 9.88±1.52 seconds, 6MW of 2003±278 feet, MVIC of 20.69±7.23 N/BMI, and CAR of 0.89±0.11. **Conclusions**: Short and long term outcomes were not affected by the simultaneous, bilateral TKA. All patients regardless of group equaled all preoperative scores by 12 weeks with the exception of MVIC which was achieved by 52 weeks. **Clinical Relevance**: While it appears that simultaneous, bilateral TKA does not hinder strength and functional outcomes, future research should determine differences between the simultaneous and staged, bilateral procedure to add to the literature that the simultaneous procedure has a 50% shorter hospital stay and 18% lower hospital costs.

AN EXAMINATION OF THE KNOWLEDGE BASE OF HOME HEALTH PROFESSIONALS REGARDING ELDER MISTREATMENT. C.R. Wooton, N.Q. Williams, A.L. Harrison, Rehabilitation Sciences, University of Kentucky, Lexington, KY; P.B. Teaster, Graduate Center for Gerontology, University of Kentucky, Lexington, KY.

Purpose/Hypothesis: Home health care professionals are in a unique position to identify the mistreatment of older adults. The purpose of this study was to determine the knowledge base of home health care professionals in Kentucky regarding the topic of elder mistreatment. **Subjects:** A random selection of home health care agencies in Kentucky were identified through a web site with a complete listing. 500 surveys were mailed and 201 surveys (40%) were returned representing over half of the agencies. Professionals represented were: Physical therapists (PT)12%,physical therapist assistants (PTA)4%, registered nurses (RN) 62%, speech language pathologists (SLP) 3%, licensed practical nurses (LPN) 6%, occupational therapists (OT) 6%, certified OT assistants (COTA)<1%, other 3%. **Materials/Methods**: The survey was developed based on qualitative information received from focus groups conducted with PTs and PTAs and consisted of the following areas: demographics, legal requirements, distinguishing among multiple types of mistreatment, barriers to recognizing and reporting elder mistreatment, sources of education on the topic, and recommendations for professional development in this area. The analysis of results was descriptive and performed using the

Access database. **Results:** Of the 201 respondents, 61% (65% of PTs) had practiced 11 years or more. 35% of all respondents (26% of PTs and PTAs) indicated they were very knowledgeable about the topic of elder mistreatment and 58% (63% of PTs and PTAs) were somewhat knowledgeable. Of the group perceiving themselves as somewhat or very knowledgeable, 98% were aware that they were required to report, 79% knew that reporting could be anonymous, and 86% knew they were not liable. Of this group, 63% were able to accurately identify an abusive situation from a case scenario and 93% were able to identify neglect. Barriers identified for reporting suspected mistreatment were: fear of retaliation, lack of confidence in the system, uncertainty of suspicions, potential for escalation of abuse, patient fear of going to live in a nursing home, and concern that patient or family would avoid seeking future medical care. Of all respondents, 38% had received less than 3 hours of education, while 33% had received 3-5 hours of education on this topic. Most valuable education received was: on the job training (51%) and continuing education (24%). Recommendations by PT respondents for future professional development included annual reviews of signs and symptoms through such approaches as on-line or in person continuing education. **Conclusions**: While the majority of home health practitioners surveyed were knowledgeable about elder mistreatment, there were substantial barriers and knowledge deficits identified by respondents and investigators. Increased education regarding identification and reporting of elder mistreatment is recommended. **Clinical Relevance**: Creative approaches to on-going continuing education such as web based educational programs would assist clinicians as they strive to stay updated on this topic.

QUALITATIVE ANALYSIS OF PHYSICAL THERAPIST STUDENT REFLECTIONS FOLLOWING AN INTERDISCIPLINARY GERIATRIC SERVICE LEARNING COURSE. D. Pariser, M. Wiegand, P. Gillette, Physical Therapy, Bellarmine University, Louisville, KY; N. Rowan, A. Faul, P. Yankeelov, S. Deck, K. Borders, L. Nicholas, Kent School of Social Work, University of Louisville, Louisville, KY.

Purpose/Hypothesis: To analyze the written reflections of physical therapist (PT) students after participating in an interdisciplinary geriatric evaluation and self-management program (GEMS) for community dwelling older adults. **Subjects**: Seventeen first and second year PT students enrolled in an elective service learning course. **Materials/Methods**: Qualitative coding and analysis of PT student open ended reflection papers, journal assignments and comments from course evaluations from three semesters were analyzed for recurring themes. **Results:** Three major themes emerged from the student reflection papers and journal assignments: (1) the value placed on applied service learning experiences in the GEMS project; (2) student self-discovery; and (3) the experience of interacting with other members of an interdisciplinary team. The first theme (applied service learning) was exemplified in reports focusing on older adults' safety; developing and modifying a plan of care for older adults; benefits of helping older adults develop confidence in ADL skills and social lives; participating in the research process as well as helping to improve clients' health, and teaching clients empowerment in self-management. The second major theme (student self-discovery) was demonstrated by comments recognizing personal age-related biases; clarification of career goals and interests; thinking as eventual practicing clinicians; realization of preventative care value; overall enjoyment of working with the older adult population, and service delivery in the home; and the exploration of personal and clients' feelings about end of life issues. The third theme (interdisciplinary health care) addressed the benefits for client care and the realization that social workers make unique and valuable contributions to health care that complement and support the clients' physical therapy goals. PT students occasionally felt overwhelmed communicating with numerous other members of the health care team. **Conclusions**: PT student participation in interdisciplinary, home based service learning with older adults was reported as a positive learning experience. Qualitative analysis revealed that the students valued the clinical exposure, developed personal insights and improved their understanding of the role of physical therapy in an interdisciplinary health care environment. Funding source: HRSA #61-1029626. **Clinical Relevance**: This qualitative study suggests the value of PT students providing interdisciplinary care to community dwelling elders through a service learning model.

VALIDATION OF THE TIMED UP AND GO TEST TO PREDICT FALLS. J. Killough, Physical Therapy, College of St. Scholastica, Duluth, MN.

Purpose/Hypothesis: A common problem among community dwelling elders (CDE) is falls, which can result in injury or death. The Timed Up and Go Test (TUGT) is used as a screen to identify potential fallers. Previous research has validated the use of the TUGT to identify those who have previously fallen. However, the test has not yet been validated in its ability to predict falls. The purpose of this study was to determine a cut-off time for the TUGT above which CDE were more likely to fall in the following year. **Subjects**: Subjects were 122 CDE over the age of 65 recruited from senior citizen living complexes, health fairs, wellness seminars, senior centers and the community. They demonstrated an ability to walk for six meters with or without an assistive device and to follow directions. **Materials/Methods**: The TUGT was administered as part of a larger study to assess efficacy of a new Fall Risk Screen. The screen consisted of questions related to risk factors including previous falls, and the TUGT. Participants were administered the TUGT only once, unless instructions were misunderstood, in which case the time from a second trial was used. Following screen administration, subjects were called approximately every 3 months during the following year and asked about any falls or steps taken to

prevent falls. T-tests were performed to determine whether differences existed between mean TUGT times, and receiver operating characteristic (ROC) curves were used to identify appropriate cut-off times. **Results:** The T-test comparing mean TUGT times between previous fallers and non-fallers demonstrated a significant difference, p=0.005, with means of 12.2 seconds (0.5 S.E.) and 10.6 seconds (0.3 S.E.) respectively. The T-test comparing mean TUGT times between subsequent fallers and non-fallers demonstrated no differences, p = 0.139. The means for this analysis were 11.7 seconds (0.5 S.E.) and 11.0 seconds (0.5 S.E.) respectively. The ROC curve for the previous falls analysis demonstrated an area of 0.640 that was significantly different from a null hypothesis of true area = 0.50, p=0.008. From this ROC curve a cut-off time of 10 seconds was determined to identify previous fallers. The sensitivity and specificity for the 10 second cut-off time was: 0.72 and 0.52 respectively. The ROC curve for the subsequent falls analysis demonstrated an area of 0.558 which was not different from a null hypothesis, p=0.277, so no time was appropriate as a cut-off. Both of these ROC curves may be biased as some fallers had identical TUGT times as non-fallers. **Conclusions**: It was impossible to determine a cut-off time on the TUGT that predicted actual falls in the subsequent year. There were also no differences in TUGT times between subsequent fallers and non-fallers. While there were demonstrable time differences between previous fallers and non-fallers, the sensitivity and specificity at a 10 second cut-off were not high enough to generate confidence in fall classification. **Clinical Relevance**: These results make the test questionable as a predictive screen for determining potential fallers in community dwelling elders.

DAY CARE CENTERS: NOT JUST FOR KIDS ANYMORE. C.M. Camp, LIFE Geisinger, Scranton, PA.

Purpose: As our nation's population ages, there is a need to provide services, as well as resources, for caregivers to maintain quality of life for older adults whom continue to live at home. The purpose of this presentation is to describe a unique model of day care serving the frail elderly, who would otherwise reside in a nursing facility. **Description**: This program is held at an adult day care center, which provides comprehensive services five days a week to eligible participants during daytime hours to support his or her personal caregiver. The overall philosophy of this program is to maintain a familiar home environment at a participant's maximum level of social, physical, and cognitive function. This program is funded through a three-way contract, which does not require physical therapy to bill nor limit the number of sessions per month, as all services are captured in a monthly capitation. In addition to therapy sessions, this funding provides each participant with a comprehensive list of services. All participants in this program must live safely at home and reside within the designated geographical area that provides these services; however, they must also meet nursing home and financial eligibility. Currently, all forty-three participants enrolled in this program have been formally evaluated by a licensed physical therapist. During an initial evaluation, the physical therapist, along with the interdisciplinary team, administers a fall risk assessment and develops an individualized care plan. Additional programs have been established by physical therapy, including the "walk to dine" and a continence program. The "walk to dine" program was designed to maintain mobility for thirty-eight of the participants who are able to ambulate or transfer within the center. The continence program consists of twenty participants that are provided with appropriate interventions such as scheduled toileting and therapeutic exercise to avoid incontinence and maintain skin integrity. In addition, the physical therapist instructs an exercise group three times a week that encompasses various upper and lower extremity exercises, as well as individualized skilled treatment as indicated. **Summary of Use**: Since the implementation of this program in January, all participants have maintained his or her present functional mobility, as well as not demonstrating a decline in their overall cognitive status. Through caregiver satisfaction surveys, caregivers have expressed overall decrease in personal stress levels with regards to care for their loved ones, as well as an increase in overall quality of life of the participant. **Importance to Members**: Within this model of care, physical therapy has the ability to contribute to wellness for older adults as compared to the traditional model of fee for service. This alternative approach provides respite care services for the caregiver, while preventing a decline in functional status and improving the quality of life of older adults living within the community.

USE OF GRADED EVIDENCE AND CLINICAL OUTCOMES TO MAKE AN INFORMED RECOMMENDATION REGARDING USE OF MONCHROMATIC NEAR-INFRARED PHOTOTHERAPY TO IMPROVE IMPAIRMENTS IN OLDER ADULTS WITH DIABETIC PERIPHERAL NEUROPATHY. G.L. Pariser, S. Keeling, S. Sullivan, D. Boyce, T. Brosky, Physical Therapy, Bellarmine University, Louisville, KY; R. Plunkett, Progressive Health, New Albany, IN; Z. Ladha, , Foot First, New Albany, IN.

Purpose: The primary purpose was to grade evidence for monochromatic near-infrared phototherapy (MIRE) for treatment of decreased foot sensation, impaired balance, and neuropathic pain in older adults with diabetic peripheral neuropathy (DPN). The secondary purpose was to compare graded evidence to clinical outcomes of 35 older adults with DPN who received MIRE. **Description:** Eight papers were identified. The Modified Canadian Task Force on Health Examination grading system was used to assign each paper a grade of evidence. The papers included one Grade I (well-designed randomized placebo controlled trial [RPCT]), one Grade II-1 (RPCT with limitations), and six Grade III (observational) studies. The grading system was also used to determine strength of the recommendation for MIRE for improving sensation and balance and decreasing pain. **Summary of Use:** MIRE procedures were similar in all

studies. Foot sensation documented by Semmes Weinstein monofilament (SWM) improved in all studies. However, in the Grade I RPCT improvements were similar for the MIRE and placebo groups. An intermediate strength grade was made with the caveat that the recommendation for MIRE might change with new evidence. Neuropathic foot pain documented by the Visual Analog Scale (VAS) was an outcome in two Grade III studies and the Grade II-1 RPCT. Neuropathic pain decreased in all three studies. Subjects in the Grade II-1 study received active MIRE on one limb and placebo MIRE on the other but evaluation of foot pain was limited to the active limb. Because none of the studies employed a placebo group, the assigned grade was a very weak recommendation. Balance was documented by the Tinetti Scale in two Grade III studies and by questionnaire in the Grade II-1 study. Since subjects in the Grade II-1 study received active MIRE on one limb and placebo MIRE on the other there was no placebo group for balance. Although MIRE improved balance in all three studies the grade of recommendation was very weak. The graded evidence indicated weak or insufficient evidence to recommend MIRE. Clinicians may initially deal with this quandary by comparing their clinical outcomes to the literature. Here, the medical records of 35 older adults (69.6 + 11.0 yrs) with DPN who received MIRE were examined to determine if MIRE was associated with increased foot sensitivity and reduced pain. Prior to treatment with MIRE 7.98+ 2.53 sites were insensitive to the 5.07 SWM. After treatment the number of insensate sites decreased to 2.56 + 3.40 ($p < .001$). Neuropathic pain measured by the VAS was 5.85 + 3.32 prior to treatment with MIRE and 2.15 + 2.83 after treatment ($p < .001$). **Importance to Members:** This project showed insufficient evidence to recommend for or against the use of MIRE to improve common impairments in older adults with DPN. Our clinical outcomes are supportive of the use of MIRE in this population, but more RPCTs are needed to better inform practice.

MUSCLE STRENGTH IN COMMUNITY-DWELLING OLDER ADULTS ASSESSED WITH HAND-HELD DYNAMOMETRY: AN INTERRATER AND INTRARATER RELIABILITY STUDY. K. Kaufman, R.A. English, S. Schaffer, E. Withrow, A.L. Harrison, Rehabilitation Sciences, University of Kentucky, Lexington, KY.

Purpose/Hypothesis: To evaluate correlations of interrater and intrarater reliability using hand-held dynamometry testing in a health fair setting of community-dwelling older adults. The nature and position of the procedures were used to develop valid methods for screening of older adults in a health fair/promotion setting. **Subjects**: Eighteen subjects (9 males, 9 females) participated in the study. Subjects ranged in age from 47 to 90 (mean of 60). Follow-up testing was performed 6 days later with 6 subjects (5 males,1 female). **Materials/Methods**: Subjects were tested bilaterally on each lower extremity by both raters to obtain an average muscle strength score. Rater order was determined by random assignment. Four tests were performed on each lower extremity, all in a sitting position. Testing order was standard for all subjects starting on the right LE. Muscle testing order was: Abduction break test (AB), quadriceps break test (QB), quadriceps make test (QM), anterior tibialis break test (AT). After testing both extremities, a second trial was performed at each site, with a third test performed if the first two results were separated by > 15%. Data were analyzed using the Intraclass Correlation Coefficient (ICC), models 2-1, 3-2. **Results:** Correlation values are described as moderate (.500 to .699), high (.700 to .899), and very high (.900 to 1.0). Interrater reliability showed moderate to very high ICC values of: AB= .682, QB= .902, QM= .866, and AT= .747. Intrarater reliability showed high to very high ICC values of: AB= .855, QB= .855, QM= .961, and AT= .809. All correlations were significant at the level of $p < .01$. **Conclusions**: Reliability testing of hand-held dynamometry supports the use of the make test with the quadriceps and the break test with each of the measured muscle groups in this population in a health fair setting. **Clinical Relevance**: Muscle strength is highly correlated with fall risk and is important for community-dwelling older adults to maintain their function and prevent co-morbidities associated with inactivity. In this study, muscle strength testing in the community-dwelling older adult was shown to be reliable using hand-held dynamometry. Since health promotion and injury prevention are important in the practice of physical therapy, this is a useful tool in a setting where screening is utilized to identify health risks.

ADAPTIVE BALANCE STRATEGIES EXHIBITED DURING GAIT BY OLDER AND YOUNGER ADULTS IN RESPONSE TO SENSORY CHALLENGES TO DYNAMIC BALANCE. H.L. Rogers, R.L. Cromwell, Physical Therapy, UTMB - SAHS, Galveston, TX;J. Grady, Office of Biostatistics, UTMB, Galveston, TX; G. Weaver, Rehabilitation Sciences, UTMB, Galveston, TX; C. Layne, Department of Health and Human Performance, University Of Houston, Houston, TX; J. Bloomberg, Neuroscience Graduate Program, UTMB, Galveston, TX.

Purpose/Hypothesis: Age-related balance deficits and falls pose serious health risks for older adults. Older adults fall most often during dynamic activities such as gait, especially when surfaces are irregular or varied. Gait requires dynamic balance, the ability to maintain balance while moving, and is controlled by integration of multiple sensory and motor systems. Success with dynamic balance depends in part on an individual's ability to adapt to changing sensory environments. Knowledge is limited concerning the adaptations to movement strategies must occur for older and younger adults to maintain dynamic balance during challenges to two key sensory systems, proprioception and vision. The purpose of this study was to characterize the adaptive balance strategies older and younger adults produced during gait under conditions of single sensory challenge (proprioceptive or visual) and simultaneous proprioceptive and visual challenge. **Subjects**: In this 2(group) X 4(condition) factorial design study, 40 subjects (20 young/20 older adults)

ambulated under 4 conditions: a level firm surface, unstable surface, firm surface with vision obscured, and unstable surface with vision obscured. **Materials/Methods**: Adaptation to gait was measured by changes in gait speed, stride length, cadence, and Gait Stability Ratio (GSR). Adaptation regarding head stability was measured by peak head and trunk angular velocities in three planes of motion: pitch, roll and yaw. **Results:** Significant main effects for gait condition were found for gait speed ($p<.0001$) and cadence ($p<.0001$). Significant main effects for the interaction of age and gait condition were found for stride length ($p = .001$) and GSR ($p = .002$). A significant main effect for condition was found for peak trunk velocity in the roll plane ($p<.0001$). Significant interaction effects were found for peak head velocity in pitch ($p = .001$), roll ($p = .006$) and yaw ($p = .003$) and for peak trunk velocity in pitch ($p = .008$) and yaw ($p<.0001$). **Conclusions**: Both older and younger adults adapt gait speed, cadence and lateral trunk motion under conditions that challenge sensory systems in order to assume a more stable gait. Adaptations to stride length, GSR, and peak head and trunk velocities in other planes, however, differ for older and younger adults depending on the type of sensory challenge. Older and younger adults exhibit adaptive changes to gait and head stability parameters that vary in degree as challenge increases. Under the same conditions, older adults in general show greater adaptation to gait and achieve less stability of the head in space than do young adults indicating poorer control of dynamic balance. **Clinical Relevance**: The results of this study add to the understanding of dynamic balance control and age-related changes in balance. This knowledge has relevance clinically in that it may improve identification of older adults with an increased risk for falling.

WHAT DOES BALANCE CONFIDENCE TELL US ABOUT AMBULATORY ACTIVITY IN COMMUNITY-DWELLING OLDER ADULTS? J.T. Cavanaugh, M. Morey, GRECC, Veterans Affairs Medical Center, Durham, NC; P.R. Vandenberg, C. Pieper, Center for the Study of Aging and Human Development, Duke University Medical Center, Durham, NC.

Purpose/Hypothesis: Previous studies provide mixed support for the idea that older adults with lower balance confidence necessarily restrict their activity. Importantly, studies of confidence and activity neither have directly recorded free-living ambulatory activity nor have considered the potential influence of gait speed. We sought to address these limitations by examining relationships among balance confidence, monitored ambulatory activity, and gait speed in a cross-sectional sample of seniors living in the community. **Subjects**: 65 adults (78.6 +/- 6.2 years old, 58% female, 85% white, non-Hispanic, BMI = 26.6 +/- 5.0). 24 reported difficulty in either climbing 10 stairs or walking 0.5 miles. **Materials/Methods**: Balance confidence was measured using the Activities-specific Balance Confidence (ABC) Scale. Ambulatory activity data were collected continuously for 2 weeks using a StepWatch3 Activity Monitor (Cyma Corporation, Mountlake Terrace, WA). Ambulatory activity was quantified in terms of average daily steps, bouts, and minutes. Gait speed was measured at usual and fast pace over a 2.4 m walkway. Controlling for age, sex, race, mobility difficulty, and height, we used canonical correlations (alpha = 0.05) to examine relationships between the domains of (1) balance confidence and ambulatory activity, (2) gait speed and ambulatory activity, (3) balance confidence and gait speed, and (4) balance confidence plus gait speed and ambulatory activity. **Results:** Subjects were relatively confident in their balance (ABC = 82.3 +/- 15.5), had mildly diminished gait speed (usual pace = 1.05 +/- 0.27 m/s; fast pace = 1.51 +/- 0.38 m/s), and ranged from sedentary to very active (average daily totals: 8713 +/- 3594 steps, 65.3 +/- 15.1 bouts, and 313.1+/- 94.9 minutes). There was no significant relationship between either the domains of balance confidence and ambulatory activity [canonical correlation = 0.22, $p = 0.43$] or gait speed and ambulatory activity [canonical correlation = 0.36, $p = 0.08$]. Balance confidence was significantly associated with gait speed [canonical correlation = 0.50, $p = 0.0003$], with fast pace speed accounting for more of the association. The combination of balance confidence and gait speed produced a significant correlation with ambulatory activity [canonical correlation = 0.44, $p = 0.05$], with lower confidence and higher gait speed tending to be associated with more steps and minutes of activity. **Conclusions**: Our data help to resolve previous uncertainty in the literature by reinforcing the idea that balance confidence, although positively associated with gait speed, indicates relatively little about actual ambulatory activity in community-dwelling seniors. Gait speed appears to modify the relationship between balance confidence and activity. **Clinical Relevance:** Physical therapists should be cautious about interpreting the ABC scores of community-dwelling seniors to make inferences about ambulatory activity. More confident seniors are not necessarily more active. Less confident seniors do not necessarily restrict their activity.

INTERDISCIPLINARY GERIATRIC ASSESSMENT AND SELF-MANAGEMENT INTERVENTION IMPROVES FUNCTION IN COMMUNITY-DWELLING OLDER ADULTS. P.D. Gillette, M. Wiegand, D. Pariser, Physical Therapy, Bellarmine Univ., Louisville, KY; A. Faul, P. Yankeelov, N. Rowan, L. Nicholas, K. Borders, S. Deck, Kent School of Social Work, University of Louisville, Louisville, KY.

Purpose/Hypothesis: To evaluate the benefits of comprehensive geriatric assessment, self-management and telehealth support for older adults living at home. **Subjects**: Control group (n=19), Experimental group (n=12). **Materials/Methods**: Community dwelling adults age 65 and older were assessed by an interdisciplinary team of social workers and physical therapists using best practice methods of each discipline. Based on the assessment, an individualized plan of care (POC) was developed and participants were randomly assigned to either a control (n=19) or experimental (n=12) group. The physical

therapy assessment included systems review, home hazard assessment, and the following functional tests: Instrumental Activities of Daily Living (IADL), Functional Reach, Timed Up and Go (TUG), and Timed Chair-Sit-to-Stand. The POC for both groups included the physical therapist's suggestions for an individualized exercise program, recommendations to modify home hazards, and individualized written instructions for self-management interventions. Control group clients were to implement their POC on their own until the post test at 12 weeks. In addition to the POC, experimental group clients received a follow-up self-management program that included support phone calls by social workers and face to face visits. ANCOVA analysis was performed on all outcome variables to investigate differences in post-test for the two groups, after controlling for pretest scores. **Results**: The experimental group showed increased IADL scores ($p<0.01$). The experimental group also demonstrated improved Timed Chair-Sit-to-Stand completions ($p<0.01$) indicating increased strength in the hip and knee extensor muscle groups. Improvement on this test is known to correlate with better function and balance, and reduced fall risk. **Conclusions:** Interdisciplinary self-management interventions focused on preventative health and supported by phone contact and/or home visits improved IADL and lower extremity muscle strength in community dwelling older adults. **Clinical Relevance**: Interdisciplinary health care team assessment and intervention in the home setting may prevent functional decline in older adults.

WALKING DUAL TASK PERFORMANCE IN OLDER ADULTS: FEASIBILITY OF THREE COGNITIVE TASKS AND ASSOCIATIONS AMONG MEASURES OF BALANCE AND ATTENTION. K.L. McCulloch, Division of Physical Therapy, University of North Carolina at Chapel Hill, Chapel Hill, NC; T.E. Shubert, C.A. Giuliani, Curriculum in Human Movement Science, University of North Carolina at Chapel Hill, Chapel Hill, NC.

Purpose/Hypothesis: 1) To describe the feasibility of three tests of dual-task performance during walking for older adults with different levels of education 2) To compare dual task performance to measures of attention and balance. **Subjects**: 95 ambulatory older adults (mean age 78.5 +/- 5.6, 21% male, 25% African American) participated. Twenty-eight subjects had attended grade or high school, 13 had an associate's degree, and 55 had college degrees. **Materials/Methods**: All subjects were timed performing a single motor task consisting of a 40 foot walk with a turn, and three cognitive tasks 1) reciting the alphabet, 2) reciting every other letter of the alphabet, and 3) odd number counting 1-29. The three dual tasks were: 1) walking while reciting the alphabet (ABC), 2) walking reciting every other letter of alphabet (ACE), and 3) walking reciting odd numbers (ODD). Dual task walking time, cognitive task accuracy, and dual task costs were calculated. Subjects also completed tests of attention (Symbol Digit Modality Test [SDMT]) and balance (Four Square Step Test [FSST] and 360 turn). **Results:** Task feasibility: All subjects were able to perform the walking task. Single task cognitive performance: 96% of subjects could perform ABC, 83% ACE and 88% ODD. For individuals with a high school education (HS) only 89% could recite ABC, 75% ACE, and 75% ODD. Dual-task costs: Walking time slowed on all tasks with median relative costs of 9.7% for ABC, 40% for ACE, and 25% for ODD. Cognitive task accuracy was relatively stable in the dual-task condition for the ABC task and ODD task with median scores of 0.0, but decreased for the ACE task (7.66). Pearson correlations were not significant between dual task costs (cognitive or walking) and SDMT, FSST or 360 turn. Correlations showed significant associations between the rate of correct responses for ABC, ACE, and ODD with the FSST (-.38, -.37, and -.39, $p < .01$), SDMT (.56, .54, .62 $p < .01$) and 360 turn (-.36, -.27, -.28, $p <.01$). **Conclusions:** Cognitive task difficulty is an important consideration for testing dual-task performance. For individuals with a HS education or less, commonly used cognitive tasks may be difficult and make interpretation of dual-task performance unclear. For this segment of the population, assessing the ability to recite the alphabet should be tested first before assessing dual task. For all subjects, the motor task had the greatest decrements in performance in all three dual task conditions. Individuals with faster rates of cognitive task responses also performed well on assessments of balance and attention. **Clinical Relevance**: Using patient education level to choose appropriate assessments may provide better insight into dual task performance. The ability to maintain walking speed while performing additional tasks like talking is important for safe ambulation. Including a walking while talking test and assessing change in walking speed may be an important addition to physical therapy examination.