Combined Sections Meeting 2008
Section on Geriatrics Poster and Platform Presentations

The Combined Sections Meeting (CSM) will be held February 6-9, 2008, in Nashville, TN. Those interested in attending may read more at www.apta.org. See the onsite program for poster and platform presentation times. After CSM, all platforms and posters will be available online. Many posters will be designated as 'posters to go,' meaning that you can contact the authors to host the poster at your chapter meetings, conferences, etc.

PLATFORM PRESENTATIONS

CORRELATIONS BETWEEN THE TIMED UP AND GO, AGE, AND POSTURAL SWAY IN OLDER ADULTS. Tuzzon AE, Ingersoll CD. Dept. of Therapy Services and Exercise & Sport Injury Laboratory, University of Virginia Health System, Charlottesville, VA.

Purpose/Hypothesis: To examine the relationships between Timed Up and Go score, age of the participants and areas of standing sway in active, non-falling, older adults. **Subjects:** 32 independent, non-falling, community-living adults aged 76 ± 5.6 years. **Materials/Methods:** The Timed Up and Go, age and closed-base standing center of pressure (COP) area were measured in one session at a local senior center. Closed-base standing COP was measured with both eyes open and eyes closed. Only participants who could stand for 10 seconds with a closed base of support and eyes closed were included. None of the participants had a history of falling in the last year. **Results:** The range of Timed Up and Go scores were from 8 to 22 seconds. There was no correlation between age, closed-base standing COP area and the Timed Up and Go in this active, healthy older population ($p>.05$). There was a significant relationship between the areas of COP with eyes open and eyes closed ($r=.72$, $p<.001$). However, none of the other variables measured correlated with one another ($p>.05$). **Conclusions:** There was no relationship found between the Timed Up and Go, age, and standing postural sway. The Timed Up and Go may be more appropriate for populations with a variety of functional levels than in a population of independent, active seniors. Modifying the instructions to encourage a faster, but safe gait during the test might be helpful for future use of this instrument. **Clinical Relevance:** The Timed Up and Go is a popular test used frequently in research as well as in the clinic. Finding the optimal instructions in administering this test as well as understanding which populations are most appropriate for this test is of great clinical relevance.

INFLUENCES ON IMPROVEMENT IN OLDER ADULTS COMPLETING A GAIT AND BALANCE CLINIC INTERVENTION PROGRAM. Bishop M, Patterson T, Romero S, Light K, Vega MF. University of Florida, Gainesville, FL, and Boston University, Boston, MA.

Purpose/Hypothesis: Falls among older adults have significant physical and psychological effects; fall related injuries are significant due to associated health care costs. Exercise intervention programs improve balance, strengthen lower limbs, and increase elders confidence in performing daily activities, which reduces the frequency of falls. The purpose of this study was to determine factors that influence changes in balance and mobility in older adults participating in a rehabilitation program designed to improve balance and reduce falls. **Subjects:** Records of 255 consecutive patients from a Geriatric Gait and Balance Clinic between 1997 and 2002 were reviewed. All patients were aged between 60 and 90 years and the majority were men (3% female). **Materials/Methods:** The clinic collects standardized outcomes. Separate hierarchical regression was performed using Berg Balance Scale (Berg), Dynamic Gait Index (DGI), Timed Functional Movements Battery (TMB), and SF-36 as primary outcome variables. Primary intervention strategies include individualized exercise programs with follow-up once a month for three months, review of polypharmacy, or vestibular interventions as appropriate. **Analysis:** Factor analysis was performed to reduce the number of strength measures. To examine influence on outcome hierarchical linear regression was performed using Berg, DGI, TMB and SF36 as response variables. Predictor variables were base-line scores, pain, strength, falls efficacy, and presence of joint dysfunction. In addition, a regression model was built for patients with joint dysfunction, separate from the group calculations. **Results:** Factor analysis reduced the eight strength measures to three factors: extensor strength (quadriceps and plantar flexors), hip abductor strength, and ankle dorsiflexor strength. For the regression models, when all the subjects were considered, the only predictor of final outcome scores was the baseline test score for each of the outcome variables: Berg ($F7,48= 7.80$; $p<0.001$); DGI ($F7,26=2.99$; $p=0.027$); SF-36 ($F7,18=6.57$; $p=0.003$). TMB was the exception as leg extensor strength was also a significant predictor ($F7,16=8.19$; $p=0.003$; extensor strength $p=0.021$; initial score; $p=0.003$). When subjects with joint dysfunction were considered, leg strength and falls efficacy were significant predictors of outcome for Berg, TMB and DGI. **Conclusions:** These data suggest that a general exercise program may improve balance and mobility in older adults as measured using the outcome variables used in this study. However, we suggest that for patients with joint dysfunction interventions for improving limb strength and minimizing falls efficacy should be emphasized. **Clinical Relevance:** Quadriceps and plantar flexor strength have an influence on improvement in balance and mobility and are an important factor to examine in older adults, especially men, with joint conditions.

THE EFFECT OF HIP AND ANKLE FLEXIBILITY TRAINING ON OLDER ADULT GAIT. Christiansen CL, Heise GD. University of Colorado at Denver & Health Sciences Center, Denver, CO and Sport and Exercise Science Department, University of Northern Colorado, Greeley, CO.

Purpose/Hypothesis: The purpose of this study was to examine effects of a hip and ankle stretching intervention on flexibility and gait biomechanics of older adults not previously active in exercise participation. It was hypothesized that increases in hip extension and ankle plantar flexion range of motion (ROM) would occur from the intervention. Accompanying the flexibility increases were expected increases in freely chosen gait speed (FCGS), stride length (SL), and joint angular displacement. **Subjects:** 37. **Materials/Methods:** Healthy older adults 62 to 82 years of age participated. Assessment of each participant was made before and after an 8 week period. The experimental (EXP) group participated in home flexibility training for the 8 weeks while the control (CON) group made no changes to their physical activity routine. Both groups had weekly visits with the primary investigator to encourage compliance and receive exercise training as needed. Hip extensor flexibility was measured with participants in the Thomas Test position and ankle plantar flexor flexibility was measured as dorsiflexion ROM with the knee extended. Gait variables were measured during both FCGS and set gait speed (SGS) (1.5 m/s) trials. Data were captured for gait variables using a video motion analysis system. **Results:** Hip extensor flexibility increased as measured by combined passive ROM of hip extension and knee flexion in the Thomas Test position from 59.7 deg pre- to 66.5 deg post-assessment in the EXP group ($p = 0.002$). Ankle plantar flexor flexibility increased from 7.8 deg pre- to 11.3 deg post-assessment in the EXP group ($p = 0.001$). Freely chosen walking speed increased from 1.23 m/s pre- to 1.30 m/s post-assessment in the EXP group ($p < 0.001$). During gait, increasing trends were noted in hip angular displacement and SL from pre- to post-assessment in the EXP group at both FCGS and SGS, but increases were not statistically significant compared to the CON group. No trends of change were noted in ankle angular displacement at either gait speed. **Conclusions:** Healthy, previously non-exercising older adults demonstrate functional benefit from 8 weeks of flexibility training. The implication is that joint ROM is a specific age-associated impairment that can be modified to enhance older adult gait function. The promotion of routine stretching exercise for healthy individuals has been criticized due to insufficient evidence of benefit. Based on results of this study, recommendations for routine hip extensor and ankle plantar flexor stretching appear reasonable for healthy older adults. **Clinical Relevance:** The findings of this study are clinically significant. For a person to functionally ambulate in the community, a minimum level of gait speed is required. Decline in gait speed is directly related to age-associated disability. This study supports previous suggestions that joint ROM may be a key impairment dictating gait change in older adults. Application of such a flexibility program for older adults with conditions that exacerbate ROM impairment may result in even greater improvements.

VALIDATION OF THE LATE LIFE FUNCTION AND DISABILITY INDEX (LLFDI) AND GAIT EFFICACY SCALE (GES) WITH PERFORMANCE BASED MEASURES OF FUNCTION AND MOBILITY IN COMMUNITY DWELLING OLDER ADULTS. Talkowski JB, Wert D, VanSwearingen J, Brach J. University of Pittsburgh, Pittsburgh PA.

Purpose/Hypothesis: Defining the relation of recently developed self-report measures of function and mobility with established performance-based measures is important to determine construct validity and potential clinical applications. We examined the validity of the LLFDI function, LLFDI disability and GES self report measures by comparison to performance based measures of physical function [7-item Physical Performance Test (PPT)] and mobility (gait speed). We expected participants with better function, less disability and greater confidence in walking would perform better on the PPT and walk faster. We also hypothesized self-reported function and disability would discriminate between participants classified as high vs. low functioning, and self-reported walking confidence would discriminate between those walking at usual vs. slow speeds. **Subjects:** Twenty community-dwelling older adults (mean age 74.3 [5.3] years; 90% white; 40% male) participated in this cross-sectional validation study. **Materials/Methods:** Self-report measures included the LLFDI function, LLFDI disability and the GES (all measures score range, 0-100; higher scores=better function, less disability or greater walking confidence). Performance based measures included the PPT (0-28, higher scores=better function) and gait speed. Construct validity was determined using Spearman Rho correlations to define relations between self-reported function, disability, and confidence in walking with the performance based measures. Mann Whitney tests were used to assess differences in self-reported function and disability for participants classified as high (PPT ≥75 percentile) vs. low functioning (PPT <75 percentile), and differences in self-reported walking confidence between those who walked at usual (>1.0m/s) vs. slow (≤1.0m/s) speeds. **Results:** Self-reported function (LLFDI function) and confidence (GES) were positively related to gait speed ($r=0.75$, $p<0.001$; $r=0.60$, $p=0.007$ respectively). Self-reported function, differed between participants classified as high (n=15) vs. low (n=5) functioning (LLFDI function: 65.6 vs 52.8, $p=0.03$). Self-reported disability (LLFDI disability) was not associated with the performance based measures and did not discriminate between functional groups. Reported confidence in walking differed between participants walking at usual (n=14) vs. slow (n=6) speeds (GES: 97.5 vs. 90.5 $p=0.025$). **Conclusions:** Construct validity was demonstrated for the LLFDI function and GES scales by the relation with performance-based measures and by expected differences in known functional and mobility groups. **Clinical Relevance:** These self-report measures may provide complimentary information that adds to, but does not replace, the description of physical function of community-dwelling older adults provided by physical performance-based measures.

USING PHYSICAL PERFORMANCE MEASURES TO PREDICT THE ONSET OF BASIC ADL DISABILITIES IN COMMUNITY-DWELLING OLDER ADULTS. Huang WW, Perera S, Studenski S, VanSwearingen J. Division of Geriatric Medicine and Dept. of Physical Therapy, University of Pittsburgh, Pittsburgh, PA.

Purpose/Hypothesis: To assess the predictive value of five physical performance measures for the onset of disability in basic activities of daily living (ADL) at 6, 12, and 18 months. **Subjects:** 115 community-dwelling older adults (mean age, 80; SD, 6.9; range, 67-98 years) who reported no disability in basic ADLs at baseline were included for analysis. All participants scored 24 or more in Mini-Mental State Exam (MMSE) and 3 to 10 in Short Physical Performance Battery (SPPB). **Materials/Methods:** In this prospective cohort study, older adults were visited at home every 6 months for 18 months. Basic ADLs were assessed using the 7 ADL items (bathing, dressing, eating, getting in/out of bed/chairs, personal hygiene, walking, using the toilet) from National Health Interview Survey (NHIS) during each visit. The onset of basic ADL disability was defined as self-report of disability in any of the 7 ADL items. Physical performance measures including gait speed, Short Physical Performance Battery (SPPB), Berg Balance Scale (BBS), grip strength, and Timed Up & Go Test (TUG) were completed at baseline.
Results: After controlling for age and co-morbid conditions, logistic regression analysis of the data indicated that BBS was the most consistent and strong predictor for the onset of disability in basic ADLs over an 18-month period (6 months, OR=0.864, C statistic=0.715; 12 months, OR=0.801, C statistic=0.786; 18 months, OR=0.829, C statistic=0.788). The SPPB and grip strength predicted the onset of disability at 12 and 18 months. Gait speed was not a significant predictor of basic ADL disability at 6, 12, or 18 months. **Conclusions:** Berg Balance Scale, followed by Short Physical Performance Battery and grip strength were predictive for the onset of basic ADL disability over an 18-month period in community-dwelling older adults. **Clinical Relevance:** Screening nondisabled older adults with simple clinical tests of physical performance such as BBS, SPPB and grip strength would allow clinicians to distinguish those at increasing risk for ADL disability.

RELATIONSHIP OF FRONTAL PLANE CENTER OF MASS CONTROL VARIABLES TO SLIP OUTCOMES. Espy D, Pai Y. University of Illinois At Chicago, Chicago, IL.

Purpose/Hypothesis: The purpose of this study is two fold: to investigate, in unperturbed walking, whether step width or frontal plane center of mass (COM) control can predict a person's ability to recover from an induced slip; and to investigate the extent to which frontal plane COM and BOS control during an anterior posterior (A-P) slip affect the outcome of the slip. We hypothesize that the step width and frontal plane COM control exhibited during natural gait and during the first, unexpected slip, will differentiate between those who will be able to recover from an induced slip and those who will not. **Subjects:** 34 healthy adults, 65 years and older. **Materials/Methods:** Subjects walked on an instrumented walkway while wearing a safety harness during motion capture of their regular gait. After 10 unperturbed trials, an AP slip was induced unexpectedly under the right heel at touchdown (TD). Motion data were used to calculate the frontal plane variables step width, COM position, normalized COM position, and COM velocity. These were calculated at right heel TD, left foot lift off (LO), and subsequent right foot touchdown (RCTD). Subjects were grouped by outcome of the first slip trial into the fall or the recover group. T-tests were used to compare the frontal plane variables at the three gait instants for the fall vs. the recover group for natural walking and for the slip trial. **Results:** Upon the first slip, all 34 subjects experienced a loss of balance: 19 subjects fell (fall group), the other 15 did not (recover group). During unperturbed walking, at TD and LO, there were no differences in the frontal plane variables between the fall group and the recover group. At left touchdown (RCTD), there were small, but significant differences in the lateral position of the COM and the step width between the two groups; but no differences in normalized COM position or COM velocity. At the three gait instants examined during the first, unexpected slip, there were no differences between the fall group and the recover group in step width, or any of the other frontal plane COM variables measured. **Conclusions:** Altered frontal plane center of mass control in stance, stepping, normal walking, and perturbed gait, as well as increased step width during gait, have been implicated as risk factors for falling associated with aging. We, therefore, expected step width and frontal plane COM control during natural walking and throughout a slip to be different between the group who fell as a result of the slip and those who were able to recover. We found only small differences during natural walking and none during the slip. **Clinical Relevance:** Balance and gait training in older adults which have the goal of fall prevention should focus on those areas which pre-dispose one to falling. In this case, step width and lateral control of the body's COM, during natural gait and during a slip, appear not to have been, as is frequently believed, related to the subject's ability to recover from an induced slip.

THE EFFECT OF PHYSICAL ACTIVITY ON STRENGTH, BALANCE, FUNCTIONAL MOBILITY AND FALLS IN THE ELDERLY. Walker CL, Rocci MN, McKenzie HM, Nassif EJ, Elazzazi AM.. Community Health Center, Johnstown, NY; St. Elizabeth Medical Center, Utica, NY; Dartmouth-Hitchcock Medical Center, Lebanon:, Fitness Forum, Herkimer, NY; Utica College, Utica, NY.

Purpose/Hypothesis: Elderly individuals have impairments that lead to decreased functional mobility and balance and increased incidence of falls. This study investigated the effect of physical activity (PA) levels on lower extremity (LE) strength, balance, functional mobility, and falls. We hypothesized that individuals who were active would exhibit comparatively greater LE strength, better balance and functional mobility, and report fewer falls. **Subjects:** This cross-sectional study was

a between group comparison. Approval was obtained from the Utica College Institutional Review Board and community facilities where subjects were recruited and data were collected. A sample of 57 healthy men and women over the age of 65 completed the study. **Materials/Methods:** Subjects were placed into groups based on PA levels determined by questionnaires. Dynamometry, the Berg Balance Scale, and the 50-foot walk test were used to assess LE strength, balance, and functional mobility, respectively. Descriptive statistics were calculated. LE strength, balance, and functional mobility were analyzed in relation to levels of PA using MANOVA. The differences of fall status between active and sedentary individuals were analyzed using Chi square. **Results:** Significant differences were found between groups in all dependent measures ($p < 0.05$). The mean (sd) values were as follows for the active and sedentary groups, respectively: (a) knee extension strength, 66.1 (19.3) lbs. vs. 53.8 (19.6) lbs.; (b) ankle dorsiflexion strength, 50.4 (13.5) lbs. vs. 38.8 (9.5) lbs.; (c) Berg Balance score 54.96 (2.0) vs. 53.12 (2.5); and, (d) gait speed 4.95 (0.88) vs. 4.41 (0.88) feet/second. **Conclusions:** Subjects who reported a more active life style demonstrated greater LE strength, higher Berg Balance Scale scores, and faster gait speeds on the 50-foot walk test. Active elderly individuals may perform activities more efficiently. The efficiency in which they perform activities may improve their quality of life since they may accomplish tasks in shorter periods of time than those who are sedentary. Our primary hypothesis was supported; however, there was no difference in falls status between groups. Levels of PA, LE strength, balance, and functional mobility skills do not fully explain risk for falls in the elderly. Contrary to prior studies, we found that those who are physically sedentary are not at an increased risk for falling. This conclusion may be explained by a tendency for sedentary elderly individuals to take fewer risks than their more active counterparts and thus sustain fewer falls. **Clinical Relevance:** Clinically, it is important to assess elderly patient's leg strength, mobility and balance. It is especially important to ask those who demonstrate weakness and balance difficulty about the types of activities that they perform on a daily basis. They may divulge that they are wary of falling and do not participate in PA where there is a chance of falling. This can provide clinicians with opportunities to treat impairments effectively and educate patients about the benefits of increased PA.

SARCOPENIA IN FRAIL ELDERLY OBESE PARTICIPANTS: ROLE OF EXCESS SKELETAL MUSCLE LIPID ACCUMULATION. Frimel TN . Sinacore D, Wright NR, Villareal DT, Klein S. Physical Therapy and Internal Medicine, Washington University, St. Louis, MO.

Purpose/Hypothesis: To quantify skeletal muscle lipid accumulation in sarcopenic skeletal muscle of obese older adults with mild to moderate physical frailty and to assess its impact on strength and function. **Subjects:** Eighteen physically-frail, obese elderly participants (13 women, 5 men; mean age=69 ± 4, BMI=36.7 ± 5,PPT= 29 ± 2). **Materials/Methods:** Intra-myocellular (IMCL) and extra-myocellular (EMCL) lipid content in the soleus (SOL) and medial gastrocnemius (MG) muscles were quantified by non-invasive magnetic resonance spectroscopy (1H MRS) using a 3T whole-body imaging system. Thigh and calf muscle and fat volumes were quantified using magnetic resonance imaging. Muscle strength (peak torque) of the lower extremities was quantified using a Biodex Isokinetic dynamometer. The nine item physical performance test (PPT) was used to provide an objective assessment of physical function. T-tests were used to compared IMCL and EMCL values between muscles. Pearson correlation coefficients were calculated to assess impact of lipid content on strength and function. **Results:** IMCL content was 2.9% ± 1.5 and 3.5% ± 1.8 in the MG and SOL, respectively. EMCL content was 12.4% ± 8.4 and 9.2% ± 8.1 in the MG and SOL, respectively. IMCL and EMCL contents in the predominately slow twitch SOL were not significantly different ($p > .05$) compared to MG. MG IMCL content correlates negatively with LE strength ($r = -0.16$ to -0.42) and function ($r = -0.46$), whereas EMCL accumulation in both LE muscles (predominately MG) was inversely associated with LE strength. EMCL accumulation in the SOL negatively impacts function ($r = -0.42$). **Conclusions:** Obese older adults with mild to moderate physical frailty have an excessive amount of IMCL present in MG and SOL. Excess lipid accumulation in predominately type II muscle fibers negatively impacts strength and function to a greater degree than excess lipid accumulation in slow twitch fibers. Clinical Relevance: Skeletal muscle lipid content is elevated in elderly obese individuals. Increased lipid accumulation in the muscle with aging may be a critical component of sarcopenia. Further studies aimed at improving our understanding of the role of therapeutic interventions for ameliorating impairments in sarcopenia will assist physical therapists in the design of optimal exercise prescriptions to improve physical function. **Supported by:** New Investigator Fellowship Training Initiative (NIFTI), Foundation for Physical Therapy & NIH R01 AG 025501.

AGE DOES NOT REDUCE ONE'S ABILITY TO ADAPT AND RESIST BACKWARD FALLING FOLLOWING REPEATED SLIP EXPOSURE. Pai Y, Espy D, Bhatt T, Wang E, Pavol,M. Depts. of Physical Therapy, Movement Sciences, and Nursing, University of Illinois at Chicago, Chicago, IL; Dept. of Kinesiology and Nutrition, Oregon State University, Corvallis, OR.

Purpose/Hypothesis: A previous study found that with repeated exposure to slipping during a sit-to-stand task, fall incidence decreased at a similar exponential rate in young and older adults. This study investigated whether such adaptations adopted by the Central Nervous System (CNS) were task specific. **Subjects:** Forty young (18-35 yrs) and 30 older (>65 years) subjects participated in the study. **Materials/Methods:** Slips were induced during walking using low-friction platforms, in both the young and older adults, after they were secured in a safety-harness. Subjects underwent a block of 8 slips, a block of 3 non-slip trials, another block of 8 slips, second block of 3 non-slip trials, and a block of mixed trials. The outcome of a slip was classified as recovery, loss of balance, or fall. Dynamic stability was obtained as the shortest distance between the measured

center of mass state (position and velocity) and the model-predicted threshold for backward loss of balance at liftoff of the recovery step. The older adults' results were contrasted to those of young during walking and to the existing data on older adults' slip-related adaptive behavior during the task of sit-to-stand (N=40, >65 yrs). **Results:** In the first 5 repeated slips, the older adults adjusted the COM state to increase their stability at the recovery step liftoff ($p<.001$), contributing to a decrease in loss of balance (from 100% to <5%) and falls (from 50% to 0%) incidence ($p<.001$). On the first re-slip after the non-slip block the older adults had a balance loss incidence of only 20% and fall incidence of < 5%. Such rapid changes in both the behavioral outcome as well as the control of dynamic stability were similar to those of the young adults and similar to older adults' adaptation to slips during sit-to-stand ($p>0.05$). **Conclusions:** The adaptive ability of the CNS for control of COM state stability, to prevent backward falling, appears to generalize across age and tasks. **Clinical Relevance:** The behavioral benefit from such adaptation, of being able to avoid slip-related falls, in both young and older adults, could have a broad application across different activities of daily living.

PHYSICAL THERAPY INTERVENTIONS FOR OLDER ADULTS WITH CHRONIC PAIN. Beissner K, Papaleontio M, Olkhovskaya Y, Reid MC. Ithaca College, Ithaca, NY, and Weill Cornell Medical College, New York, NY.

Purpose/Hypothesis: The high prevalence of chronic pain among older adults, coupled with concerns over medication side-effects, lead to an increased interest in the non-pharmacological management of pain in this growing population. Physical therapy (PT) and cognitive behavioral therapy (CBT) are two commonly used approaches to pain management that have increasing research support. Some components of CBT, such as muscle relaxation, distraction techniques, and activity pacing, overlap with interventions used by physical therapists. We conducted a nationwide survey of physical therapists to determine a) the types and frequency of use of specific interventions employed by therapists when treating older patients with chronic pain and b) their level of interest in (and perceived barriers to) incorporating CBT approaches into PT treatment programs. **Subjects:** Of 184 APTA Geriatrics and Orthopaedic Section members contacted by telephone, 152 (82.6%) agreed to participate. **Materials/Methods:** Subjects completed a 10 minute telephone survey regarding treatments used with older adults with chronic pain. Initial questions addressed the frequency with which therapists use a variety of treatment options; additional items ascertained therapists' interest in, and barriers to use of specific CBT approaches. Data were analyzed with descriptive statistics. **Results:** Older adults with chronic pain comprised more than 50% of the patient case load for 28% of subjects. Frequently used active interventions for the treatment older adults with pain included the following types of exercise: joint stability (94.7%), joint mobility (94.1%), and general stretching/strengthening (90.8%). Most frequent passive techniques were thermal agents (69%), soft tissue techniques (55.9%), and electrical stimulation (45.4%). The most frequently used CBT interventions were activity pacing (80.3%), counseling on scheduling pleasurable activities (38.8%), and cognitive restructuring (23.1%). Interest in CBT was high, with greatest interest in activity pacing (98%), cognitive restructuring (94.1%), and muscle relaxation (91.4%). The most common barriers to using CBT include lack of knowledge/skill in the technique (59.2%), reimbursement concerns (30.9%) and lack of time (27.0%). **Conclusions:** While some passive therapeutic modalities are used regularly by physical therapists, treatments emphasize active exercise. Many therapists are interested incorporating CBT into their therapeutic programs, but concerns with their knowledge about the techniques, time constraints, and reimbursement concerns currently limit use of CBT by physical therapists. **Clinical Relevance:** In February 2007 the American Heart Association recommended non-pharmacologic interventions as the first line therapy for older adults with chronic pain. If these guidelines are followed, increasing numbers of patients with chronic pain conditions will be referred to PT. This study identifies the preferred interventions used by therapists to treat patients with pain, and highlights interest in and barriers to incorporating elements of CBT into PT practice.

ARE EARLY ASSESSMENTS OF OLDER ADULTS' COGNITIVE PROCESSING PREDICTIVE OF DECLINES IN PHYSICAL FUNCTION AND INCREASED DISABILITY A YEAR LATER? Schrodt L, Giuliani D, Mercer V. Freburger J, Sheps CG, Hartman M, Busby-Whitehead J. Western Carolina University, Cullowhee, NC; Center for Human Movement Science, Center for Health Services Research, Institute on Aging and Program on Aging, University of North Carolina at Chapel Hill, Chapel Hill, NC.

Purpose/Hypothesis: Cross-sectional research supports an important relationship between cognitive processing and independent function in older adults. However, the longitudinal relationship of cognitive processing to future declines in independent function is less clear. Identifying predictors of functional decline is important to prevent disability with aging. The purpose of this study was to examine the predictive relationship of cognitive processing to declines in physical function and increased disability one year later. **Subjects:** Community-dwelling older adult volunteers (N=62, mean age 80.7 ± 5.0 years at baseline, 68% 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 score of cognitive processing (Z-COG). Physical function was assessed with the 360° turn, the Physical Performance Test (PPT), and walking speed. The SF-36 Physical Function Sub-scale (PF-10) and OARS Instrumental Activities of Daily Living Scale (OARS) assessed mobility and IADL disability. Participants with meaningful decline in any physical function or disability measure, or required an increased

level of care at one year were identified as having decreased independent function. Linear regression and logistic regression analyses examined the relationship between baseline cognitive processing and change in physical function and disability, and decreased independent function. **Results:** Poorer baseline Z-COG scores were linearly associated with a one year decline in 360° turn (R2=.12, p < .01). No linear relationship was observed for baseline cognitive processing to change in PPT, walking speed, or PF-10. Logistic regression analyses demonstrated that poorer baseline Z-COG scores were predictive of increased disability as measured by PF-10 (OR=2.85, 95% confidence interval [CI] 1.29-6.27) and OARS (OR=2.59, 95% CI 1.19-5.67). Poorer baseline Z-COG scores were also predictive of decreased independent function (OR=3.05, 95% CI 1.52-6.11). All p-values for logistic regression analyses were < 0.05. **Conclusions:** Poorer cognitive processing is associated with increased risk of disability and decreased independent function one year later in community-dwelling older adults. Associations between baseline cognitive processing and decreased physical function were inconsistent, with poorer cognitive processing only associated with decreased 360° turn. **Clinical Relevance:** Cognitive processing is an important consideration in preventing disability and preserving independence in older adults. Including measures of cognitive processing in examination of older adults may help identify those at risk for loss of independence and serve to help guide interventions.

COMPARISON OF GLUTEUS MEDIUS ELECTROMYOGRAPHIC ACTIVITY DURING FORWARD AND LATERAL STEP-UP EXERCISES IN OLDER ADULTS. Sharma S, Weeks E, Mercer V. University of North Carolina at Chapel Hill, Chapel Hill, NC.

Purpose/Hypothesis: Step-up exercises are often suggested for strengthening hip abductor muscles and improving balance in older adults. Little is known, however, about whether the forward or lateral version of this exercise is best for targeting the hip abductor muscles. The purpose of this study was to examine the electromyographic (EMG) amplitude of the gluteus medius (GM) muscle bilaterally during forward versus lateral step-up exercises. We hypothesized that GM EMG amplitude would be greater for lateral step-ups because of the greater movement of the center of mass (COM) in the frontal plane during this exercise. **Subjects:** Participants were 26 community dwelling adults (6 men, 20 women) over the age of 65 years. All subjects were able to negotiate curbs independently without an assistive device. **Materials/Methods:** Surface EMG was recorded from GM muscles bilaterally during performance of forward and lateral step-ups. A dual force platform system and pressure switches were used to identify ascent and descent phases. The exercises were performed with the right leg leading during ascent and the left leg leading during descent. Exercises were paced with a metronome set at 66 bpm. Differences in normalized (RMS) amplitude for type (forward vs. lateral) and phase (ascent vs. descent) of exercise were examined using separate repeated measures analysis of variance (ANOVA) for the right and left legs. Alpha was set at 0.05. **Results:** Phase durations were similar for forward vs. lateral exercise and for ascent vs. descent. For the right leg only, GM EMG activity was higher for lateral than forward step-ups and for ascent as compared to descent phases (p<.05). Mean GM RMS values for both legs ranged from approximately 96 - 139% of a side lying submaximal holding contraction. No significant interaction effects were observed. **Conclusions:** Step-up exercises are effective in activating the GM, with lateral step-ups requiring more GM muscle activity than forward step-ups in the leg that leads during ascent. **Clinical Relevance:** Lateral step-ups may be better than forward step-ups for GM muscle strengthening. For symmetrical strengthening, equal numbers of repetitions should be performed with the right and left legs leading during the ascent phase.

POSTER PRESENTATIONS

MINIMUM DETECTABLE CHANGE IN GAIT VELOCITY DURING ACUTE REHABILITATION FOLLOWING HIP FRACTURE. Hollman JH, Beckman BA, Brandt RA, Merriwether EN, Williams RT, Nordrum.JT. Mayo School of Health Sciences, and Dept. of Physical Medicine & Rehabilitation, Mayo Clinic, Rochester, MN.

Purpose/Hypothesis: Clinicians can measure and document a patient's gait velocity as a means for providing an objective assessment of functional improvement during rehabilitation following hip fracture. Interpreting the magnitude of change in gait velocity that is clinically meaningful, however, can be difficult. The purpose of this study was to calculate the minimum detectable change (MDC) as a measure of responsiveness of gait velocity in patients hospitalized following surgical fixation for traumatic hip fractures. **Subjects:** Fifteen adults age 65 or older with acute, traumatic, unilateral, intra-capsular hip fractures were recruited from St. Marys Hospital in Rochester, MN, to participate in this study. Subjects included six men and nine women who provided consent to participate in the study. **Materials/Methods:** Subjects performed two timed trials of the 10 meter walk test (10 MWT). Subjects were permitted to walk with the use of a gait aid, most often a rolling walker, but no verbal or tactile cueing was given to aid ambulation. Investigators used a stopwatch to measure the time it took for subjects to complete the 10 MWT and subsequently calculated gait velocity. The mean and standard deviation (SD) of subjects' first 10 MWT trial was calculated and a test-retest (ICC3,1) reliability coefficient was calculated using gait velocity data obtained from the second trial of the 10 MWT. The SD and test-retest reliability coefficient data were then used to calculate the MDC at a 95% level of confidence. **Results:** Across subjects, mean gait velocity was equal to 15 cm/s with a SD of 5 cm/s. The test-retest reliability, estimated with the ICC3,1 coefficient, was equal to 0.813 (95% CI = 0.515 to 0.936). The MDC was equal to 6 cm/s. **Conclusions:** Based on these preliminary results, the gait velocity of a patient in the acute phase of rehabilitation following surgical fixation of a traumatic, unilateral hip fracture must improve by 6 cm/s or more in order to desig-

nate the change as being meaningful and beyond the bounds of measurement error. **Clinical Relevance:** Clinicians may use this data to establish a threshold for interpreting meaningful change in gait velocity.

THE EFFECTS OF LOADED VERSUS UNLOADED ACTIVITIES ON FOOT VOLUMETRICS IN OLDER ADULTS. McWhorter JW, Michael B, Mike R, Docter C, Sue S. University of Nevada, Las Vegas, Las Vegas, NV.

Purpose/Hypothesis: The purpose of this study is to determine if there is a significant difference between foot volumes (edema) in pre versus post-exercise measurements during a loaded activity (treadmill walking) or an unloaded activity (upright exercise bike) in subjects 50 years of age and older. **Subjects:** The subjects consisted of 21 female and 10 male volunteers with no history of musculoskeletal injuries, health problems or surgery to the lower extremities. The age range was from 50 to 67 years with a mean of 56 +/- 4.9 years. **Materials/Methods:** All subjects were required to rest for a minimum of 10 minutes prior to testing. At the conclusion of this resting session, blood pressure, oxygen saturation, and heart rates were obtained and recorded. A pre-exercise volumetric measurement of the right leg was then obtained by having the subject lower the right foot into the volumeter. The activity for the first condition (walking or cycling) was randomly chosen. Each subject completed two 10-minute exercise sessions. Immediately following both exercise sessions, heart rates, oxygen saturation and blood pressures were again measured followed by volumetric measurements. At least 48 hours of rest was required between the two exercise sessions. **Results:** The data from this study showed that, in healthy subjects 50 years of age and older, treadmill walking resulted in significant increases in foot and ankle fluid volumes compared to resting measurements, $p<.0005$). Additionally, when considering each gender separately, males produced significant increases in foot volume following treadmill walking, while females displayed no significant changes. The biking protocol showed no significant change in foot volume in both genders. **Conclusions:** Our study demonstrated a 1.4% increase in foot volume after 10 minutes of treadmill walking. This significance remained when considering males separately, but not females. It is our recommendation to prescribe non-weight bearing exercise to patients where foot swelling is a problem, or with pre-existing conditions such as congestive heart failure or peripheral vascular disease in order to minimize the risk for further lower extremity edema and other more serious complications. **Clinical Relevance:** In patients where foot swelling is a complication, physical therapists may opt to use a cycle ergometer (unloaded activity), rather than treadmill walking (loaded activity), in order to achieve a cardiovascular training effect. Although not significant, the cycle ergometer showed a tendency to reduce lower extremity swelling.

ASSESSING THE LEARNING STYLE OF OLDER CONSUMERS: IS ASKING ABOUT SENSORY RECEPTOR PREFERENCE A RELIABLE INDICATOR? Chesbro S, Peacock J. Dept. of Physical Therapy, Howard University, Washington, DC.

Purpose/Hypothesis: An older individual's learning style preference is an educational component that tends to change as one ages. The purpose of this study was to determine if there is a difference between one's perceived learning style preference compared to that identified by a standardized assessment tool. Additionally, this study examined which sensory receptor (auditory, kinesthetic/tactile, or visual) older individuals rely on most to learn new tasks. **Subjects:** A convenience sample of 102 adults between the ages of 50 and 92 years (mean=60) participated in this study. The majority of the participants were females (n=68, 66.7%). Fifty-four participants were between the ages of 50 and 59, 34 participants were age 60 to 69, 12 participants were age 70 to 79, and two participants were over 80 years old. Fifty-two participants identified as Black or African American, and 50 identified as Caucasian or Euro American. The exclusion criterion included individuals with known cognitive deficits. This study was approved by the Howard University Institutional Review Board. **Materials/Methods:** Participants were asked to identify their age, gender, race and how they "preferred to learn a new task— by hearing, doing/touching, or seeing?" Five days later, participants completed the Priestly Learning Style Assessment (PLSA) tool. The PLSA is an online tool that assess an individual's dominant sensory receptor in order to determine their preferred learning style (www.ldpride.net). The PLSA consists of 30 questions with an average completion time of less than 4 minutes. A mini-reliability study of this tool was performed at 6 weeks following the initial assessment period (n=8). The test-retest reliability of the PLSA showed no difference in preferred learning style over time (r=1.00). **Results:** When the participants' perception of their preferred learning style was compared to findings on the assessment tool, only 41.2% were in agreement ($p<0.001$). Participants' perception of learning style preference showed 22 believed they were visual learners, 68 believed they were kinesthetic/tactile learners, and 12 believed they were auditory learners. According to the PLSA, 51 participants were assessed as visual learners, 36 were kinesthetic/tactile learners, and 15 were auditory learners. **Conclusions:** Asking an older consumer how they prefer to learn is not an accurate method of assessing learning style. Basing educational interventions on this simple question of sensory receptor preference may result in less effective outcomes. **Clinical Relevance:** The majority of participants in this study believed they were inesthetic/tactile learners, learning best through moving, doing, and touching. In reality, when compared to the results of the assessment tool, the majority were assessed as visual learners. This result is in agreement with the vast amount of research that has been done in the geriatric community which shows older individuals rely heavily on sight as they age.

EXERCISE RESONANCE: THE EXPERIENCE OF WOMEN WHO ADOPT EXERCISE AFTER AGE 50. Weddle M. College of St. Catherine, Minneapolis, MN.

Purpose/Hypothesis: This study describes the experience and meaning of exercise behavior change for healthy women who had not engaged in exercise prior to the age of 50 and who incorporated exercise into their lives on a regular and ongoing basis, after 50 years of age. **Subjects:** Eight healthy, community-dwelling women over the age of 51 who started exercising after age 50 and had consistently maintained an exercise routine for at least the past 12 months participated in this study. Participants had no history of self-initiated, consistent exercise for periods of greater than 6 months during any previous period in their lives. **Materials/Methods:** A qualitative, phenomenologic research method was used. Semi-structured, audio-taped interviews were conducted in which participants described their experience of exercise behavior change. Interview transcripts were analyzed to reveal the themes, subthemes, structure and essence of women's lived experience of exercise behavior change. **Results:** Multiple factors played a part in bringing each participant into a successful and sustainable relationship with exercise and these factors emerged from the data as four themes: stimulus to initiate exercise, assimilation of exercise into life, relationship with exercise, and life context. Thematic analysis revealed an abstract expression of the essence of participants' lived experience of exercise and this was described as the experience of exercise resonance. Establishing a habit of exercise occurred via mechanisms that that were not overtly evident to the participants and their descriptions of the exercise behavior change process were murky. Identifying their behavior change process may have been difficult because they did not have to fundamentally change themselves to assimilate exercise into their lives – exercise was simply resonant. **Conclusions:** The participants' success in maintaining exercise was linked to their adaptability and desire to maintain vital lives as they aged. The exercise behavior change process did not appear to be associated with extensive, conscious and deliberate effort, planning and strategizing on the part of participants. It is necessary to critically examine the models currently driving much of the research in exercise behavior change since current models may not fully capture the contextual meaning that exercise has for older women. Models derived from a holistic, rather than a reductionist worldview may be of value. **Clinical Relevance:** This study illustrates the complexity of the process of exercise behavior change and suggests that exercise behavior in older women may best be understood by considering the life context of the exerciser. Offering an older woman a choice of exercise options may assist her in identifying an exercise routine that resonates with her life, which may increased her adherence to exercise.

ASSESSMENT OF THE EFFECTS OF A MULTI-DISCIPLINARY TREATMENT APPROACH ON PAIN, POSTURE, AND HEALTH AND WELL-BEING IN WOMEN WITH OSTEOPOROSIS OR OSTEOPENIA. Poulos S, Becker S, Willmeng C, O'Hearn M. Lakeland Regional Health System, St. Joseph, MI.

Purpose/Hypothesis: Osteoporosis is a disease characterized by low bone mass and structural deterioration of bone tissue resulting in an increased fracture risk. Over 40 million people in the United States have been diagnosed with osteoporosis (OPS), or its' precursor osteopenia (OPN), with the highest prevalence in women > 55 years old. Characteristics may include progressive kyphosis with associated pain and a decrease in quality of life. The purpose of this study is to report the effect of a multi-disciplinary treatment program on upright posture, pain, and the perception of overall health and well-being in women with OPS or OPN. **Subjects:** Subjects consisted of 226 women with a diagnosis of OPS or OPN who had been referred by their physician to an outpatient physical therapy clinic for treatment. **Materials/Methods:** Subjects were individually evaluated by a physical therapist prior to beginning the program. The SF-36 health questionnaire was used to assess health and well-being. Pain in the spine or hips was assessed using a 0-10 numeric rating scale. Two measurements were used to assess upright posture including a stadiometer height measurement and a Reedco® Posture Assessment form completed by the physical therapist. This is a posture assessment specifically designed for the osteoporotic population. Subjects then met in groups of 4 to 8 for 2 1/2 hours, 2 times a week, for 4 weeks. Each session consisted of 1 1/2 hours of physical therapy exercises, or body mechanics education. Many of the exercises were done in the supine position focusing on postural realignment or scapular stabilization. The remaining hour was spent receiving instruction from other healthcare professionals. At the completion of the program, each subject was again individually assessed for changes in health and well-being, pain, and upright posture. For data analysis the subjects were divided into three age groups: 65 years or under, 66-75 years, and greater than 75 years. The difference between pre and post measurements were analyzed for statistical significance using paired t-tests. **Results:** Between August 2004 and March 2007, 226 females with a mean age of 68.6 +/-9.4 years completed the program. Significant improvements ($p<0.05$) for all subjects were noted for pain (mean 2.5+/-2.6 pts) and posture as demonstrated by increased height (0.35+/-0.9 cm) and improved Reedco® posture scores (9.6+/-11.2 pts). There were no positive changes in SF-36 scores except for the domain of vitality in individuals aged 66 to 75. **Conclusions:** A multi-disciplinary treatment approach involving physical therapy and education may be effective in improving upright posture and decreasing pain in the spine and hips in women diagnosed with low bone density. However, the SF-36 may not reflect a change in the overall perception of their health and well-being.
Clinical Relevance: Physical therapists should consider involving other healthcare disciplines and using supine postural realignment exercises to more globally treat women with OPS or OPN.

EFFECTS OF AN EXERCISE INTERVENTION ON THE RELATIONSHIP BETWEEN MUSCLE STRENGTH AND IMMUNE CELLS IN FRAIL ELDERLY NURSING HOME RESIDENTS. Kapasi Z, Ignatius J, Kuhn B, Master P, Schnelle J, Fahey J. Dept. of Rehabilitation Medicine, Emory University,

Atlanta, GA; Vanderbilt University School of Medicine, Nashville, TN; and UCLA School of Medicine, Los Angeles, CA.

Purpose/Hypothesis: The purpose of this study is to test the hypothesis that changes in muscle strength following an exercise intervention is correlated with plasma levels of immune parameters at baseline in the frail elderly. **Subjects:** Fifty-two frail, nursing home residents participated in a randomized, controlled trial of a 32-week functionally oriented exercise program. **Materials/Methods:** Subjects were randomly assigned to an intervention (n=30) or control group (n=22). The intervention consisted of a functionally oriented endurance and resistance exercise training provided 5 days a week for 32 weeks. Immune parameters were measured by taking blood samples at baseline, 8 weeks, and 32 weeks. Elbow flexor and shoulder abductor strength were measured as 1 repetition maximum (1RM). Plasma levels of immune parameters such as soluble TNF receptor (sTNF-RII), CD5616 (NK cells), CD19 (B cells), CD3 (T cells), CD4 T cells, CD8 T cells, CD25IN3, and CD28IN3 were measured at all time frames. **Results:** At baseline, a negative correlation between CD8 T cells and muscle strength and a trend for positive correlation between CD19 B cells and muscle strength was found in all frail elderly subjects (intervention and control groups). Following resistance training, we found a negative correlation between CD8 T cells and muscle strength and a positive correlation between CD19 B cells and muscle strength at 8 weeks in the intervention group. No significant correlations were found in the control group at 8 or 32 weeks. **Conclusions:** Cells that produce TNF-α, such as CD8 T cells and CD19 B cells, demonstrate correlations with muscle strength and may serve as additional markers of frailty in the elderly. **Clinical Relevance:** Immune markers of frailty may help target individuals who could benefit most from a muscle strengthening exercise program.

THE EFFECT OF INTENSITY OF THERAPY ON THE EFFICIENCY OF FUNCTIONAL CHANGE IN PATIENTS WITH LOWER EXTREMITY ORTHOPEDIC PROBLEMS IN POST-ACUTE INPATIENT SETTINGS. Hartley GW, Roach KE. St. Catherine's Rehabilitation Hospital, Miami, FL and University of Miami Miller School of Medicine, Coral Gables, FL.

Purpose/Hypothesis: The purpose of this study was to identify factors affecting the efficiency of functional change in patients with lower extremity (LE) orthopaedic problems in two post-acute care inpatient facilities. Efficiency of functional change was defined as the pre-post change in the six minute walk test (6MWT) distance divided by the length of stay (LOS). **Subjects:** Thirty-seven subjects (mean age 75.54 years, sd 6.68) completed this study. 62% were female and 38% were male. All subjects were living at home prior to admission. Subjects were admitted to the post-acute settings with diagnoses of LE orthopedic conditions. The most common diagnoses were TKA (35%), THA (27%), and hip ORIF (24%). Only 16% had a restricted weight-bearing status (WBS). **Materials/Methods:** This was a prospective cohort study. Individuals with LE orthopedic problems admitted to an inpatient rehabilitation facility (IRF) or a skilled nursing facility (SNF) were recruited. At baseline, subjects completed a 6MWT and the Geriatric Depression Scale (GDS). At discharge, the 6MWT was completed to determine change in functional status. Age and WBS were collected from the medical record. LOS and minutes of PT were obtained from the billing records. The intensity of therapy was calculated by dividing total minutes of PT by LOS. The efficiency variable was created by dividing the change in 6MWT by the LOS. **Results:** Multiple linear regression was performed to examine the impact of the above variables on the efficiency variable. The mean LOS was 13.92 days (sd 7.42, range 6-36) and the average intensity of PT was 44.80 minutes/day (sd 21.46, range 13.85-73.93). The mean for efficiency was 22.26 ft/day (sd 16.55). The forward selection procedure for multiple regression entered intensity first into the model followed by age, GDS, and WBS. The final model had a R2 of .501 indicating that it explained 50.1% of the variance in efficiency, R2=.501, $F(4,32)=8.04$, $p<.001$. The largest partial R2 was .173 for intensity ($p=.01$) followed by age, with a partial R2 of .157 ($p=.004$). GDS had a partial R2 of .128 ($p=.01$) while WBS had a R2 of .045 ($p=.10$) indicating that the intensity of PT explained more variance in the change in 6MWT/day than other variables in the model. WBS was not a significant predictor. **Conclusions:** The results of this study indicate that the intensity of PT in post-acute care inpatient settings is related to the gain in functional performance/day (a measure of efficiency), after controlling for other predictors including age, depression, and WBS. **Clinical Relevance:** Limitations in intensity, often determined by payors, can lead to a longer LOS. The data in this study suggest that high intensities of PT could reduce total LOS since gains in the 6MWT are often predictive of readiness for discharge. It is also worth noting the importance depression plays on outcome in this study. GDS is a stronger predictor of functional performance gains/day than WBS. This may be due to the low Subjects with restricted WBS.

REHABILITATION OF A CENTENARIAN. Hartley GW, Gravano T, Cope KA, Lemberger RR, Santana KM. St. Catherine's Rehabilitation Hospital, Miami, FL and University of Miami Miller School of Medicine, Coral Gables, FL.

Background & Purpose: The population over the age of 100 is increasing. Individuals are living longer with chronic conditions. At present, there is little published on this group. This decreases our ability to design effective plans for these patients. Physical therapists must be aware of these patients' functional potential. This case description attempts to document this potential in a patient in this age group. **Case Description:** The subject is a 100 year old female residing in an assisted living facility (ALF) prior to admission to acute care with shortness of breath. PMH included degenerative joint disease, hypertension, congestive heart failure (CHF), spinal stenosis, dementia, and functional decline. Eleven days after admission, she transferred to an inpatient rehabilitation facility (IRF) and began physical therapy (PT) for debility due to decompensated CHF and an electrolyte imbalance. She received 19 PT treatments for a total of 810

minutes over a period of 15 days. She also received occupational therapy. Upon the IRF PT assessment, she demonstrated an increased risk for falls (Tinetti score 13/28), gross strength UEs 3+/5 and LEs 4-/5, and decreased functional status (total Functional Independence Measure [FIM] score =57). On admission the FIM score for transfers=2, walking=1, toilet transfers=3 and tub transfers=0. Her mental status was 27/30 as measured by the Mini Mental State Exam. She was able to walk 30 feet with a rolling walker and minimum assistance. She required maximum assistance to move in bed, and maximum assistance for transfers (supine to/from sit). Interventions included education and training for gait, transfers, balance, endurance, and strength. **Outcomes:** At discharge, the patient needed supervision for bed mobility. Transfers required minimal assistance (FIM =4). She was able to ambulate 60 feet (twice in a 45 minute session) with a rolling walker and supervision (FIM =2). She was able to transfer to/from a toilet and a tub with minimal assistance (FIM =4). At discharge, her total FIM score was 83, representing a gain of 26 points. The adjusted national average for admission FIM during the same quarter the patient was treated was 58.1, and the national average discharge FIM was 86.9, resulting in an average FIM gain of 28.8 (national data from Uniform Data Systems). The patient was discharged back to her ALF with home health PT, nursing, and an aide. **Discussion:** This patient presented with multiple comorbidities and significant functional decline. Despite these challenges, she made functional gains similar to those of the national average. It is important to note that these averages include a younger population. This case report demonstrates that patients among the oldest old (100 years old) can improve in functional areas measured by the FIM. Results in this case are only slightly lower than national averages for the same time period. These patients can benefit from the intensity of services provided in an inpatient rehabilitation facility. This level of service allowed this patient to return home environment and avoid institutionalization.

STABILITY OF KYPHOSIS, STRENGTH, AND PHYSICAL PERFORMANCE GAINS ONE YEAR AFTER A GROUP EXERCISE PROGRAM IN COMMUNITY-DWELLING HYPER-KYPHOTIC OLDER WOMEN. Balys S, Hamel K, Katzman W, University of California, San Francisco/ San Francisco State University, San Francisco, CA; and University of California, San Francisco, San Francisco, CA.

Purpose/Hypothesis: The purpose was to determine if subjects maintained improved kyphosis, spinal extensor strength, and physical performance gains one year after a 12-week multidimensional group exercise program. We hypothesized that a multidimensional exercise program would result in less detraining than traditional strengthening exercises. **Subjects:** Nineteen of the 21 women from the initial study, ages 65 to 80 with thoracic kyphosis of 50 degrees or greater, completed the follow-up testing at one year post intervention. **Materials/Methods:** The initial intervention consisted of multidimensional group exercise performed twice each week for 12 weeks. The exercise program included spinal extensor strengthening, flexibility exercises, and integrated spinal proprioception training. Subjects resumed their usual activities during the following year. Primary outcome measures included usual and best kyphosis. Secondary outcome measures were spinal extensor strength and physical performance as measured by the modified Physical Performance Test and Jug Test. **Results:** Subjects maintained improvements in kyphosis, spinal extensor strength, and physical performance at one-year follow-up, $p<0.05$. Best kyphosis improved by 2.5 degrees during the year, $p<0.01$. Kyphosis, strength, and Jug Test at follow-up improved over baseline measures, $p<0.05$. **Conclusions:** Hyper-kyphotic women maintained improvements in usual kyphosis, spinal extensor strength, and physical performance one year after a multidimensional group exercise program. Further improvement in best kyphosis was also observed. Detraining effects may be minimized by multidimensional exercises incorporating spinal proprioception training. **Clinical Relevance:** Incorporating spinal extensor strengthening exercises, flexibility exercises, and integrated spinal proprioception training into the exercise programs for hyper-kyphotic women over age 65 may result in improvements in kyphosis, strength, and physical performance, beyond that previously seen with strengthening exercises alone.

RE-EXAMINATION OF "NORMAL" VALUES FOR THORACIC CURVATURE IN OLDER FEMALES BASED ON THE INDEX OF KYPHOSIS. Zabel RJ, Quiben M, Liu H, Charton M. University of Central AR, Conway , AR.

Purpose/Hypothesis: The purpose of this project was to compare the Index of Kyphosis (IK) calculated as a ratio of the thoracic width (TW) and the thoracic length (TL) to previously published "normal" data from healthy subjects. **Subjects:** Data were obtained from 45 community-dwelling, healthy females (mean age 66 ± 13 years) by two experienced examiners with established reliability. **Materials/Methods:** Measurements were taken over a several month period. A flexible surveyor's ruler was applied along the spine between the C7 and L5 – S1 interspace landmarks and then removed to a grid paper where a trace of the spinal curves was made. The C7 and L5 – S1 interspace was marked on the grid and a straight line drawn connecting the marks. TW was the horizontal distance on the sagittal plane from the straight line to the point of the greatest thoracic curvature. TL was the vertical distance from the C7 marker to the point at which the curvature changed from a thoracic to a lumbar curve. The IK (TW/TL x 100) was then determined for each measurement. Data were organized into the following age group: 50 – 54 years (N=10); 55 – 59 years (N=12); 60 – 64 years (N=8); 65 – 69 (N=4); and 80+ years (N=11). Inadequate Subjects was available for ages 70 – 79 years. The mean IK and standard deviations were calculated using SPSS 14.0. The means for the current age groups were compared to the means of similar age groups from published data using a 5 x 2 ANOVA. **Results:** A significant difference ($p = .003$) existed between the current data and the published data

for all age groups. The overall mean IK for the present subjects was 13.47 ± 1.47 cm compared to the mean of the published "normal" IK data which was 28.70 ± 5.72 cm. The present data demonstrated a trend toward an increased kyphosis from age 50 – 54 (N = 10; mean IK = 13.39 ± 2.12 cm) to age 80+ (N = 11, mean IK= 14.55 ± 4.06 cm) was not significant. **Conclusions:** The results of this pilot challenge the established norms as the statistics demonstrated a difference between the subjects in our study and the subjects measured to obtain the normal values. Possibilities are that the present sample was different in the amount of physical activity, health status, health awareness, and level of health care. These conclusions may be valid and if so, further support the proposition that aging has changed in the ensuing years since the original study and that more current normal values need to be established using a larger sample. **Clinical Relevance:** Comparisons to the existing normal values of IK may limit intervention in patients who have lower values of curvature even though the patient may present at "risk" if compared to more current cohorts.

QUADRICEPS AND HAMSTRINGS MUSCLE PERFORMANCE AFTER TOTAL KNEE ARTHROPLASTY. Stevens JE, Carpenter KJ, Eckhoff DG, Kohrt WM. University of Colorado at Denver and Health Sciences Center, Denver, CO.

Purpose/Hypothesis: Muscle weakness and reduced functional capacity are present before and after total knee arthroplasty (TKA). While quadriceps dysfunction is increasingly addressed in post-operative rehabilitation, this study examined the less frequently considered hamstrings weakness and coactivation. **Subjects:** Eighteen patients with end-stage osteoarthritis were included (62.7+6.4 years; 10 women, 8 men). **Materials/Methods:** Isometric strength of the quadriceps and hamstrings was measured before and after (3 wks, 6 wks, 3 mo, 6 mo) unilateral, cruciate-retaining TKAs for end-stage osteoarthritis. Patients were asked to perform a maximal isometric voluntary contraction (MVIC) of the hamstrings and quadriceps muscles while seated with 85 degrees of hip flexion and 60 degrees of knee flexion. Muscle strength at each post-operative time point was normalized to pre-operative strength. Electromyography (EMG) was used to quantify hamstrings coactivation during a quadriceps MVIC. A pair of surface EMG electrodes (20-mm diameter) were placed over the muscle belly of the biceps femoris (2-cm apart) with a ground electrode over the medial malleolus. The surface electrodes were attached to a Biopac MP150WSW system for data acquisition at 2 kHz. All EMG signals were digitally filtered (10Hz-500Hz) and smoothed by a moving RMS average with a time constant of 50 ms. After signal processing, hamstrings (biceps femoris) EMG signal during a maximal quadriceps MVIC was normalized to peak EMG signal during a maximal hamstrings MVIC to calculate the coactivation index. **Results:** Quadriceps and hamstrings strength decreased significantly 3 wks after surgery (-43.7+22.3%; -47.6+22.4%, respectively) ($p<0.05$). Both quadriceps and hamstrings strength returned to pre-operative values by 3 mos after surgery, with no further improvement at 6 mos ($p>0.05$). Throughout the 6-mo follow-up, changes in quadriceps and hamstrings strength were comparable ($p>0.05$). There were no significant differences in hamstrings coactivation indices before or after surgery ($p>0.05$), although the coactivation index increased from 0.35+0.2 (pre-op) to 0.49+0.29 (3 wks post-op) and then returned to pre-op values for the remaining follow-up testing sessions. **Conclusions:** The isometric strength of both the quadriceps and hamstrings muscles were comparably compromised within the first month after TKA. Hamstrings coactivation was slightly greater within the first month after TKA, but did not reach significance, and therefore does not appear to play a substantial role in accounting for isometric quadriceps strength deficits immediately after surgery. **Clinical Relevance:** Quadriceps dysfunction after TKA is typically addressed in post-operative therapy protocols, but these data suggest that hamstring dysfunction is also present and should be addressed. If left untreated, hamstring weakness may account for post-operative pain from persistent hamstring tendonitis and related dysfunction of the post-operative knee. **Funding:** M01 RR000051, Physical Therapy Foundation Pittsburgh-Marquette Challenge Grant.

EFFICACY OF POST-TREATMENT INSTRUCTIONS IN PATIENTS WITH BENIGN PAROXYSMAL POSITIONAL VERTIGO. McGinnis PQ, Nebbia M, Rudolph K, Colletti A, Saez L, Brown K. Richard Stockton College of NJ, Pomona, NJ and Responsive Physical Therapy, Wall, NJ.

Purpose/Hypothesis: Benign Paroxysmal Positional Vertigo (BPPV), the most common cause of vertigo in older adults, is characterized by dizziness, nausea and nystagmus. Current physical therapy treatment for BPPV is a 4-part repositioning maneuver, followed by a period of 24 hours where the patient remains in an upright position (including sleeping). Repositioning maneuvers have been determined to be an effective treatment for BPPV; however, recent literature suggests that the post-treatment instructions of 24 hours in an upright position may not be necessary. The purpose of this study was to determine if there was a difference in treatment outcomes for patients receiving 24 hour upright posture post-treatment instructions compared to patients resuming usual activities without maintaining an upright posture. **Subjects:** Thirty-one patients with a confirmed diagnosis of unilateral or bilateral BPPV seen at an outpatient physical therapy practice during 2006 - 2007 agreed to participate in the study. The average age was 56.39 years (range 31– 80) with 23 females and 8 males. **Materials/Methods:** All patients underwent a repositioning maneuver during their treatment session. Patients were randomly assigned into 2 groups of post treatment instructions: those instructed to remain upright for 24 hours (n = 17) and those who were instructed to resume their usual activities and did not need to maintain the upright position (n = 14) post treatment. Following treatment, the participants were re-assessed for resolution of BPPV. Repeat maneuvers were performed as needed. Data analysis was performed using SPSS 14.0. **Results:** Prior to treatment there

were no significant differences between the groups in terms of vertigo intensity (p=0.913) rated on a 0 – 10 scale, or combined duration of symptoms (p=0.529). Both groups experienced a significant reduction in symptoms from pre-treatment to post-treatment. For patients in the usual activity group, there was a reduction in vertigo intensity from pre (x=4.63) to post treatment (x=0.00), (p=0.000); and reduced duration of symptoms from pre (x=43.33 sec) to post (x=2.00sec), (p=0.034). The 24 hour upright group also experienced a reduction in vertigo intensity from pre (x=4.00) to post (x=0.00), (p=0.034); and a reduced duration of symptoms from pre (x=34.50sec) to post (x=13.38sec), (p=0.020). A greater number of patients in the 24 hour upright group required a repeat repositioning maneuver (n=7), than in the usual activity group (n=2) in order to achieve symptom resolution. **Conclusions:** Regardless of post-treatment instructions, both groups experienced significant improvement in vertigo intensity and duration of symptoms. Remaining upright for 24 hours post treatment was not required for a positive treatment outcome for patients with BPPV. **Clinical Relevance:** Eliminating the burden of remaining in an upright position for 24 hours following treatment presents patients with a maximally effective treatment with an earlier return to normal daily activities.

BALANCE CONFIDENCE IN COMMUNITY-DWELLING OLDER ADULT MEN. Tam P, Greene M, Smith P, Bigelow J, Rabel M, Klima DW. University of Maryland Eastern Shore, Princess Anne, MD.

Purpose/Hypothesis: While considerable gender-mixed studies have analyzed balance confidence in the elderly, studies remain conflicting regarding links between balance confidence and physical performance in community-dwelling older adult males. The purposes of this pilot study were to 1) Examine the relationship between balance confidence and physical performance, balance, and lower extremity strength in community-dwelling older adult men and 2) Analyze differences in balance confidence among fallers versus non-fallers. **Subjects:** Subjects included 23 community-dwelling men over the age of 60 (x=69.4±5.9; range:60-82 yrs; BMI=27.4±5.2). All subjects were healthy, community-dwelling men independent in ambulation without an assistive device. **Materials/Methods:** During a structured task circuit, subjects completed a demographic profile and the Activities-specific Balance Confidence (ABC) Scale. Physical performance was measured by the Five Times Sit to Stand (FTSS) and Timed Up and Go (TUG) Tests. Subjects performed the Sensory Organization Test (SOT) on the NeuroCom SMART EquiTest System and lower extremity isokinetic peak torque measures on the Biodex System 3. Bilateral knee and ankle strength was assessed with a 5 rep. test protocol at 60°/sec. Physical performance and strength testers were blinded to ABC test administration. Data were analyzed using Pearson correlations for variable relationships and independent T tests to compare balance confidence in fallers versus non-fallers. Significance was set at the .05 alpha level. **Results:** Of the 23 subjects tested, only one subject disclosed a fear of falling on the demographic profile. Eight subjects had sustained a fall in the past year. Results revealed high balance confidence scores (x=92.5±5.7) among participants, though showed no significant correlations with physical performance measures (FTSS: r= -.21/p=.33;TUG: r=.12/p=.59). Similarly, no significant relationships were established between ABC and SOT scores (r=.20/p=.35) or peak torque in the ankle dorsiflexors, plantarflexors, knee flexors, and extensors (range: r=.02 to .37/p=.28 to .09). Balance confidence did, however, show a significant correlation with BMI (r=-.54;p=.008). Higher ABC score trends were noted among fallers than in non-fallers (93.5±2.7 vs. 91.2±2.9). All TUG scores fell below established cut-off points for fall risk (x=10.0±1.9;range:7.0-13.2 sec.). **Conclusions:** Findings of this preliminary study indicate that balance confidence does not parallel physical performance, balance, or lower extremity strength in older adult males. On the contrary, older men may be apprehensive in disclosing their fear of falling despite having sustained a fall. A unique finding of this study yielded a negative association between balance confidence and BMI. Escalating sedentary lifestyle habits might have influenced balance confidence levels. **Clinical Relevance:** Assessment of balance confidence in older adult men should proceed with caution. The fear of falling disorder is multifaceted and further investigation of additional variable domains is warranted.

HIP ABDUCTOR EXERCISE AND LATERAL STABILITY IN OLDER ADULTS AT RISK OF FALLS. Chang SJ, Mercer VS, Giuliani CA, Morey MC,; P.D. Sloane C, Williams S. Division of Physical Therapy, Department of Family Medicine and Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, Chapel Hill, NC; Department of Geriatrics, Duke University, Durham, NC.

Purpose/Hypothesis: Impaired lateral stability may contribute to falls in older adults. Maintenance of lateral stability requires the hip abductor muscles to generate force rapidly and with precise coordination. The purpose of this study was to obtain preliminary data on the effects of a 10-week program of high-velocity resistance training using a lateral trainer in older adults at increased risk for falls. **Subjects:** Twenty-one community-dwelling older adults between the ages of 74 and 93 years participated in the study. All subjects were identified as being at increased risk of falls on the basis of clinical balance test scores. **Materials/Methods:** Subjects were randomized to exercise (n=10, mean age 84.50 ± 5.58 years) and control (n=11, mean age 83.55 ± 3.24 years) groups. Exercise group subjects performed lateral trainer exercise 3 times per week for 10 weeks. Control group subjects were asked to maintain their regular physical activity and exercise levels. Balance confidence, hip abductor maximal muscle strength and rate of force development, clinical balance test performance (Four Square Step Test, Single Limb Stance, 360° Turn) and walking speed were evaluated at pre-, mid- (5-week) and post-intervention sessions. Linear mixed model analyses were applied to estimate means of outcome variables by group and time. **Results:** One subject in the exercise group withdrew after mid-

intervention testing. Exercise group subjects who completed the intervention attended at least 85% of the exercise sessions (at least 25 sessions). No significant adverse events occurred in association with the intervention. Compared to control group subjects, exercise group subjects demonstrated faster performance on the 360° Turn after intervention (p=.0131). No other significant between-group differences were found. **Conclusions:** Lateral trainer exercise can be performed safely by older adults. Although subjects in the exercise group demonstrated improved performance on one dynamic balance test after the intervention, the lack of other between-group differences suggests limited effectiveness of lateral trainer exercises when performed in isolation. Lateral trainer exercise may be beneficial as one component in a multifaceted intervention program. **Clinical Relevance:** Lateral trainer exercise may help to increase rapid, dynamic turning ability in older adults at risk of falls.

ACTIVE STEPS: OUTCOME MEASURES OF A PROGRAM FOR PEOPLE WITH DIABETES AND IMPAIRED MOBILITY. Pariser GL, Gillette P, DeMuro M, Winters S. Physical Therapy, Bellarmine University, Louisville, KY and Endocrinology, University of Louisville Medical Center, Louisville, KY.

Purpose/Hypothesis: The American Diabetic Association (ADA) states that adults with type II diabetes (T2DM) should have at least 150 min of moderate intensity physical activity (PA) per week. While the benefits of PA for people with T2DM are well documented, the ability to generalize the evidence is limited to adults without existing comorbidities. This is an important consideration because many older adults with T2DM have mobility impairments from comorbidity that limits their exercise capacity. Active Steps for Diabetes Management is a program for people with T2DM and impaired mobility who may not be able to achieve an optimal amount of exercise on their own but who can participate in medically-supervised exercise and gradually increase their PA. The purpose of this project is to evaluate Active Steps participant outcomes. **Subjects:** Active Steps participants were at least 18 yrs old and free of conditions where moderate intensity PA was contraindicated. People needing supervised exercise were encouraged to enroll. Twenty of 26 (mean age=60±3yrs) enrollees in Active Steps completed the program. Seventy percent of people who completed Active Steps required an assistive device for walking. **Materials/Methods:** Active Steps was 12 weeks and included two group meetings per week consisting of 15 min of diabetes education and 45 min of group exercise and a home program for gradually increasing PA. Outcome measures evaluated before and after Active Steps were: (1) Summary of Diabetes Self-Care Measure, (2) average number of steps walked/day measured by pedometers, (3) Six Minute Walk Test (6MWT), and (4) body mass index (BMI). Paired t-tests were used to compare pre and post-intervention means. **Results:** There were significant increases (p<.001) in the mean number of days per week that participants performed 30 min of continuous PA, number of steps walked/day, and the mean 6MWT distance. A small improvement in mean BMI was not significant. **Conclusions:** Seventy seven percent of Active Steps enrollees completed the program which was considered good because of the participant demographics. Analyses of outcome data suggest that Active Steps is effective in increasing daily PA and improving cardiovascular fitness in people with T2DM and impaired mobility. The mean number of days per week that participants performed 30 min of continuous PA increased bringing their PA closer to the amount recommended by the ADA. Pedometer-determined PA increased from sedentary to low active. Although the change in PA was significant, it is possible that the intensity of participants PA was not high enough to affect BMI. **Clinical Relevance:** Outcome measures suggest that Active Steps helps increase PA in adults with T2DM and impaired mobility. Further research is needed to determine the impact of Active Steps on glycemic control, cardiovascular health, and health care costs.

EXPERIENCED PHYSICAL THERAPISTS' PERCEPTIONS AND BEHAVIORS RELATED TO SCREENING FOR MEDICAL REFERRAL: IMPLICATIONS FOR THE OLDER ADULT POPULATION. Clark DE, Morris DM, Braswell J, Graham C, Sherer C, Fell DW, Foushee H. University of Alabama Birmingham Birmingham, ALPhysical Therapy, University of South Alabama, Mobile, AL.

Purpose/Hypothesis: Demographic trends reveal that consumers seeking physical therapy services are expected to be older, more racially diverse and medically complex. Given these circumstances, physical therapists must be prepared to identify "red flags" or signs and symptoms of underlying systemic disease in clients that warrant consultation or referral to other health professionals. Current research suggests that opportunities exist for physical therapists to improve screening for medical referral (SMR) skills related to non-musculoskeletal systems. The purpose of the study was to describe experienced physical therapists' perceptions and behaviors related to SMR. **Subjects:** A random sample of 1,108 American Physical Therapy Association physical therapist members were invited to participate in the survey. **Materials/Methods**: Participants received an email invitation and link to a web-based survey. Survey completion indicated informed consent. Survey items measured participants' perceptions of SMR, frequency of use of screening behaviors during the initial examination, confidence and perceived barriers to the performance of SMR. Descriptive statistics were calculated and analyzed for all items. **Results:** Intrarater reliability as measured by ICC(3,1) ranged from 0.71-0.88. Strong internal consistency was demonstrated by Cronbach alpha values ranging between 0.83-0.94. Participants (n = 268) had greater than ten years experience with 80% working with adult and geriatric clients. Overall, physical therapists had positive attitudes toward SMR and perceived SMR to be important to patient/client management and outcomes (P<.001). Physical therapists frequently screened the cardiopulmonary, integumentary, nervous and psychological systems, utilized selected tests and diagnostic imaging results,

and reviewed patient medications during initial client examinations (P < .001). The endocrine, urinary, gastrointestinal, and genitoreproductive systems were less frequently screened. Barriers included lack of access to patient information and equipment, a lack of confidence and insufficient time to perform SMR. **Conclusions:** Physical therapists described a strong framework for SMR utilizing body systems considered to form the basis for physical therapy practice. Opportunities exist to standardize approaches to SMR, further define physical therapists' responsibilities related to SMR across the lifespan and improve physical therapist access to vital client data and equipment necessary for the performance of tests and measures. **Clinical Relevance:** This study highlights the need for physical therapists working with the aging adult to screen for "red flags" from systems not always considered during the initial examination. As physical therapists become the practitioner of choice for the aging adult seeking to improve his/her health, wellness and physical function, physical therapists' must be competent in practices that enable them to make appropriate decisions regarding the need for referral or consultation and safe client management.

A COMPARISON OF SELF-PERCEIVED VS. ACTUAL FALLS RISK IN OLDER ADULT FEMALES RESIDING IN AN INDEPENDENT LIVING FACILITY. Dudek M, Gillispie M, Patton D, Wheeler T, Brosky JA, Pariser D, Gillette P. Physical Therapy, Bellarmine University, Louisville, KY.

Purpose: Falls sustained by older adults are a serious medical and public health problem and can result in severe injuries such as major head trauma, lacerations and fractures. In 2001, falls were the most common mechanism reported of nearly 3 million non-fatal injuries in adults over 65 treated in United States emergency departments. Many older adults may not fully understand the risk factors associated with falls or have an altered perception of their actual risk for falls. The purpose of this study was to compare the self-perceived fall risk using the Modified Falls Efficacy Scale (MFES) to actual fall risk as determined by the Tinetti Assessment Tool (TAT) in a sample of older adult females. **Description:** Nine older adult females between the ages of 56 and 79 (avg. 68) residing in an independent living community volunteered to participate in a facility sponsored health screening. A component of this health screening involved a gait and balance assessment. The Tinetti Assessment Tool was used to assess the balance and gait of each subject. Additionally, the participants completed the MFES which is a self-report measure used to determine an individual's perceived risk for falling. The MFES is a valid and reliable questionnaire that consists of 14 questions pertaining to a particular activity of daily living. Each activity is scored using a range of scores from 0 (not confident at all) to 10 (completely confident). A higher score on the MFES indicates a higher self confidence in an individual's perceived ability to prevent falls. The average scores for the TAT and MFES were 20.1 (range 14-28) and 91.9 (range 42-140), respectively. **Summary of Use:** Forty-four percent of the subjects who perceived themselves as fairly confident (e.g. not likely to fall) on the MFES were actually considered as high risk for falls based on the TAT combined gait and balance scores. The results of this study suggest that some older adults have an altered or a misconstrued perception of their falls risk. Further investigation is needed with a larger sample population to verify correlation between perceived and actual falls risk in the elderly**. Clinical Relevance** Research has shown that multi-factorial interventions can reduce the falling rate of older adults by 40%, but development and implementation of community-based programs is limited. Effective fall prevention strategies should include both clinician generated performance based tests along with patient reported outcome assessment tools to identify appropriate interventions. The number of older adults who underestimate their falls risk may be greater than reported and these individuals may require additional educational strategies to increase their self-awareness of potential injury from risk of falls.

PROGRESSION OF DYNAMIC KNEE LOADING AT ONE YEAR IN MEDIAL KNEE OSTEOARTHRITIS: THE INFLUENCE OF BASELINE LOAD. Barrios J. University of Delaware, Newark, DE.

Purpose/Hypothesis: Knee osteoarthritis (OA) is one of the five most disabling conditions of the elderly population. The medial tibiofemoral compartment is the most commonly involved. In this patient population, radiographic disease progression is associated with dynamic knee load at baseline, as measured by the adduction moment. Radiographic disease progression is also associated with static varus malalignment, which in turn is related to the adduction moment. However, little is known regarding change in the knee adduction moment and adduction angle during gait over time in this population. Therefore, the purpose of this prospective study was to assess changes in adduction moment and angle over a one year period, and assess the contribution of baseline measures to these changes. We hypothesize that progression will occur in the variables of interest over the course of one year. Further, we expect that baseline measures will be positively correlated to the magnitude of change in these variables. **Subjects:** Twenty-one patients (10 males, 11 females, mean age 62.5, mean BMI 30.7) with diagnosed medial compartment knee OA were recruited for this study. **Materials/Methods:** All patients underwent a baseline gait analysis, and returned one year later for a follow-up gait analysis. Peak adduction moment (Nm / Ht*wt) and peak adduction angle (degrees) from both visits were analyzed using paired t-tests. Pearson's correlation coefficients were also calculated between the baseline value and the magnitude of change demonstrated at the one year visit for each variable. **Results:** A 10% increase in the peak adduction moment was observed at one year follow-up (p=0.030). However, peak knee adduction angle did not increase (p=.148). There was a significant correlation between baseline peak adduction moment and the magnitude of change (r=0.46, p=0.038). A non-significant correlation was observed between baseline peak varus angle and the magnitude of change at one year (r=0.27,

p=0.230). **Conclusions:** The results of this study suggest that dynamic knee loads in patients with medial compartment knee OA increase over the course of one-year. Further, greater baseline loads are associated with greater changes over a period of one year. Knee adduction angle did not significantly change over one year. **Clinical Relevance:** These data suggest that an increased dynamic load at the knee, as seen in patients with medial compartment knee OA and varus malalignment, can lead to a greater increase in dynamic load over a one year period. Increased dynamic loading has been associated with OA disease severity and progression. Load-altering measures, such as foot orthotic devices, should be initiated early to attenuate progressive loading in medial compartment knee OA.

INTERGENERATIONAL PHYSICAL THERAPY TREATMENT: GERIATRICS AND PEDIATRICS. Ciolek CH, Schaefer MK. University of Delaware, Newark, DE.

Background & Purpose: Intergenerational experiences are not a new concept. Adult day care programs, skilled nursing facilities and retirement communities have offered programs that provide activities for older adults that involve children. Research suggests that these interactions build sensitivity and compassion in children as well as an improve sense of well being and decreased isolation in older adults. The literature does not address the role of physical therapy treatment for both children and older adults in an intergenerational clinical setting. **Case Description:** During outpatient physical therapy treatments where pediatrics and older adults participate in the same clinical space, therapists noted some similarities in interventions for clients regardless of age. A trial intervention session between a 92 y.o. female and a 6 y.o. male was conducted to address strengthening and balance training that worked within the Guidelines and Standards for Intergenerational Practice as established by Elizabeth Larkin and Vicki Rosebrook . Particularly, Standard I: The Intergenerational specialist draws upon knowledge of human development across the life span to plan and implement effective programs that bring young people and older adults together for mutual benefits and Standard VI: The intergenerational specialist is a reflective, caring professional whose purpose is to bring young people and older adults together for their mutual benefit. Patient pairing was chosen based on similarities in intervention needs. The 92 y.o. female was diagnosed with Meniere's disease and peripheral neuropathy that resulted in balance dysfunction. The 6 y.o. male was diagnosed with Developmental Coordination Disorder (DCD) with the greatest functional needs in motor planning and dynamic balance. Both patients presented with poor proximal stability. **Outcomes:** Interventions included activities that focused on dynamic standing balance, trunk rotation, and quadruped reaching. Patient compliance and interaction were improved as noted by increase duration performing tasks and improved attention to tasks. The older adult took on a mentorship role and the child demonstrated improved effort to all tasks when encouraged by a "grandmotherly" figure as opposed to a therapist. Both patients reported enjoying the experience. The older adult continued to express concern over the younger child's progress, while the younger child asks if he can "play" with the older adult. **Discussion:** This case study demonstrates feasibility of a positive intergenerational physical therapy treatment session. Further studies are needed to formally assess the outcomes of intergenerational intervention versus traditional physical therapy approach. Outcomes that should be considered include patient attitudes, community carry-over, and quality of life measures.

NOVEL MEASURES OF BALANCE AND BALANCE CONFIDENCE: RELATIONSHIPS TO FEAR OF FALLING IN COMMUNITY-DWELLING OLDER ADULTS. Goldberg A, Schepens S, Wallace M. Department of Health Care Sciences, Program in Physical Therapy, Mobility Research Laboratory, Institute of Gerontology, Wayne State University, Detroit, MI.

Purpose/Hypothesis: Fear of falling and reduced balance confidence may cause older adults to limit their daily activities, thereby increasing risk for future falls. The main purpose of this study is to compare a novel measure of balance confidence as assessed by the short version of the Activities-specific Balance Confidence (ABC) scale—the ABC-6 scale—in older adults who are afraid and unafraid of falling. We also examined differences in a novel measure of balance in older adults— trunk position sense as measured by trunk repositioning errors—as well as number of falls in older adults who are afraid and unafraid of falling. **Subjects:** Thirty-five. **Materials/Methods:** Thirty-five community-dwelling older adults (mean age 72.9 years) completed a medical history, including a report of falls in the previous 12 months and fear of falling. They also completed the ABC-6 scale, as well as a test of trunk position sense capability. Two groups were established: those afraid of falling (N=16) and those unafraid of falling (N=19). Differences between groups for balance confidence, trunk position sense, and number of falls were assessed using independent samples t-tests. Significance was set at $p<.05$. **Results:** Balance confidence, trunk position sense, and number of falls were significantly different between the groups ($p<.05$). Those afraid of falling exhibited 24% lower confidence ratings as assessed by the ABC-6 scale, 62% more trunk position sense errors, and 140% more falls than those unafraid of falling ($p < .05$). **Conclusions:** These data suggest that reduced balance confidence and increased trunk repositioning errors are associated with fear of falling. Future studies should investigate the utility of interventions targeting improvements in balance confidence and reductions in trunk repositioning errors as a means of reducing the number of older adults reporting fear of falling. **Clinical Relevance:** The trunk repositioning error test and ABC-6, two novel and valid measures of balance and balance confidence, are easy and quick to administer, and require minimal equipment. These qualities make them convenient for use as measures of balance and balance confidence in busy clinical settings. To the extent that fear of falling is related to number of falls, clinicians should consider tailoring clinical interventions to improve balance confidence and reduce

trunk repositioning errors. This may be a strategy to reduce the number of falls in community-dwelling older adults.

IS THE SHORT VERSION OF THE ACTIVITIES-SPECIFIC BALANCE CONFIDENCE SCALE A VALID MEASURE OF BALANCE CONFIDENCE, AND IS IT RELATED TO BALANCE IMPAIRMENT AND FALLS IN OLDER ADULTS? Schepens S, Goldberg A, Wallace M. Department of Health Care Sciences, Program in Physical Therapy, Mobility Research Laboratory, Institute of Gerontology, Wayne State University, Detroit, MI.

Purpose/Hypothesis: A shortened version of the Activities-specific Balance Confidence (ABC) scale—the ABC-6—has recently been proposed as an alternative measure of balance confidence. This scale includes only the 6 most challenging activities from the original scale. The purposes of this study are to determine if the ABC-6 is a valid measure of balance confidence and examine its relationship with balance impairment and falls in older adults. **Subjects:** Thirty-five. **Materials/Methods:** Thirty-five community-dwelling older adults (mean age 72.9 years) completed a medical history, including a 12-month falls history. They also completed the long form of the ABC scale (ABC-16), as well as the following clinical balance tests: single-leg stance, functional reach, timed up and go, and maximum step length. Group differences between fallers (N=16) and non-fallers (N=19) for both forms of the ABC scale were evaluated using independent samples t-tests. The relationship between the two forms of the ABC scale as well as their relationships to clinical balance tests and falls were evaluated using Pearson's product moment correlation coefficient (Pearson's r). Significance was set at $p<.05$. **Results:** ABC-6 scores were significantly lower than ABC-16 scores for the entire sample; however, the scales highly correlated with one another ($r=.95$; $p<.00$). Fallers reported significantly lower balance confidence than non-fallers ($p<.05$) as measured by the ABC-6 scale, but balance confidence did not differ between the groups when assessed by the ABC-16 scale. The ABC-6 correlated with all clinical balance tests as well as number of falls ($p\leq.05$), such that lower balance confidence was associated with poorer performance on balance tests and increased falls. The ABC-16 significantly correlated only with some clinical balance tests, and did not significantly correlate with number of falls ($p>.05$). **Conclusions:** Though both versions of the ABC scale are significantly correlated with each other, the ABC-6 appears to exhibit stronger relationships than the ABC-16 with clinical balance tests and number of falls. The ABC-6 scale is a valid measure of balance confidence, and lower ABC-6 scores are associated with balance impairment and increased number of falls in older adults. **Clinical Relevance:** The stronger relationships noted between ABC-6 and clinical balance tests and number of falls suggests its utility over the ABC-16 as a falls risk screening tool in geriatric physical therapy practice.

WHAT CAN BRIEF GAIT AND BALANCE PHYSICAL PERFORMANCE MEASURES TELL US ABOUT MORE DEMANDING TASK PERFORMANCE IN COMMUNITY-DWELLING OLDER ADULTS? Schrodt L, McPherson S, Palmer C,Watson D, Boles K, Harris J, Ohmann G, Wood J. Dept. of Physical Therapy, Western Carolina University, Cullowhee, NC.

Purpose/Hypothesis: Abnormalities of gait and balance are common contributors to falls and functional decline in older adults. Physical performance measures are often used to assess gait and balance, and as indicators of overall function. Previous studies support use of these measures to identify older adults at risk for functional decline. However, usefulness of these measures to infer performance of more demanding, comprehensive tasks is less clear. We examined the association of gait and balance physical performance measures with self-report of more demanding walking ability and balance confidence during functional tasks. **Subjects:** Community-dwelling older adults (N=66, 81.5 ± 5.9 years, 71% female), who volunteered for physical function assessments. **Materials/Methods:** Physical performance of gait and balance were assessed using gait speed and timed 360° turn. Self-reports assessed walking ability ("Does your health now limit you in walking more than a mile? If so, how much?") and balance confidence during functional tasks [Activities-specific Balance Confidence Scale (ABC)]. Correlations examined associations between physical performance and self-report variables. Differences between subjects reporting and not reporting limitations were examined via T- tests. Sensitivity and specificity examined accuracy of performance measures to detect self-reported limitations. **Results:** Gait speed and 360° turn were associated with self-report of walking a mile ($r_{pb}= -.34$, $p<.01$) and ABC ($r =-.42$, $p<.01$), respectively. Subjects who reported limitations in walking a mile demonstrated slower gait speed than those reporting no limitations ($t_{64} = 2.9$, $p<.005$). Subjects with low balance confidence turned 360° slower compared to those with high balance confidence ($t_{43} = 3.7$, $p<.001$). Sensitivity and specificity of the 360° turn for detecting low ABC score were 40% and 30%, respectively. Sensitivity and specificity of gait speed for detecting limitations in walking a mile were 50% and 80%, respectively. **Conclusions:** Gait and balance physical performance measures were moderately correlated with self-report of more demanding walking ability and balance confidence during functional tasks. Subjects who reported limitations in walking a mile or had low balance confidence also scored more poorly on gait and balance measures. Gait speed demonstrated higher sensitivity and specificity for limitations in walking a mile than 360° turn demonstrated for low balance confidence. Performance measures provide limited information regarding limitations in more demanding walking tasks and balance confidence. **Clinical Relevance:** Physical therapists should be cautious about inferring older adults' abilities to perform more demanding, comprehensive tasks based on physical performance measure scores. Gait and balance physical performance measures are valuable clinical assessments; however, combination of physical performance and self-report of more demanding tasks provides a more accurate description of daily functioning for community-dwelling older adults.