

Yalden, J. and L. Chung (2001). "Tai Chi: towards an exercise program for the older person." *Aust J Holist Nurs* 8(1): 4-13.

In the changing demographic and health care contexts of aged care, the creation of health promoting exercise programs for frail elderly people to improve wellbeing and quality of care is a common objective in community and residential aged care. This article describes the background to the development of a gentle exercise program that has therapeutic value and the potential to improve wellbeing and quality of care.

Wong, A. M., Y. C. Lin, et al. (2001). "Coordination exercise and postural stability in elderly people: Effect of Tai Chi Chuan." *Arch Phys Med Rehabil* 82(5): 608-12.

OBJECTIVE: To evaluate the effects of coordination exercise on postural stability in older individuals by Chinese shadow boxing, Tai Chi Chuan (TCC). DESIGN: Cross-sectional study. SETTING: Research project in a hospital-based biomechanical laboratory. PARTICIPANTS: The TCC group (n = 25) had been practicing TCC regularly for 2 to 35 years. The control group (n = 14) included healthy and active older subjects. INTERVENTION: Static postural stability test: progressively harder sequential tests with 6 combinations of vision (eyes open, eyes closed, sway-referenced) and support (fixed, sway-referenced); and dynamic balance test: 3 tests of weight shifting (left to right, forward-backward, multidirectional) at 3 speeds. MAIN OUTCOME MEASURES: Static and dynamic balance of Sensory Organization Testing (SOT) of the Smart Balance Master System. RESULTS: In static postural control, the results showed no differences between the TCC or control group in the more simple conditions, but in the more complicated SOT (eyes closed with sway surface, sway vision with sway surface), the TCC group had significantly better results than the control group. The TCC group also had significantly better results in the rhythmic forward-backward weight-shifting test. Duration of practice did not seem to affect the stability of elder people. CONCLUSION: The elderly people who regularly practiced TCC showed better postural stability in the more challenged conditions than those who do not (eg, the condition with simultaneous disturbance of vision and proprioception). TCC as a coordination exercise may reduce the risk of a fall through maintaining the ability of posture control.

Wolf, S. L. (2001). "From tibialis anterior to Tai Chi: biofeedback and beyond." *Appl Psychophysiol Biofeedback* 26(2): 155-74.

This keynote presentation highlights events that have contributed to scientific explorations of one research clinician. Steve Wolf traces his scientific roots to early studies in single motor unit control under the guidance of his primary mentor, John Basmajian, MD. This work led to subsequent studies on the role of EMG feedback in predicting successful outcomes in upper extremity use and in ambulatory capabilities among patients with chronic stroke. These findings are contrasted to further efforts to condition entire reflexes rather than individual muscles through use of operant-conditioning paradigms. The findings from applications of EMG biofeedback to stroke patients became the basis for minimal motor criteria in the treatment of the impaired upper extremities of patients with chronic stroke, using "forced use" or "constraint-induced movement therapy." Last, investigations into center of pressure feedback using computerized balance machines resulted in a series of experiments that ultimately led to the finding that Tai Chi as an exercise form for older adults can have a substantially favorable effect in delaying the onset of fall events.

Wolf, S. L., R. W. Sattin, et al. (2001). "A study design to investigate the effect of intense Tai Chi in reducing falls among older adults transitioning to frailty." *Control Clin Trials* 22(6): 689-704.

This paper describes the study design, methodological considerations, and baseline characteristics of a clinical trial to determine if intense (48 weeks, twice per week) Tai Chi practice can reduce the frequency of falls among older adults transitioning to frailty compared to a wellness education program. Twenty facilities will be stratified on socioeconomic status and facility type and randomly assigned to one of the two interventions. Secondary outcome measurements include variables related to function, behavior, and the biomechanics of movement. This study is unique because it represents an effort to offer a novel physical intervention to a large sample of transitional frail adults, a population that has received few formal exercise interventions. In addition to bringing the interventions into facilities, a 1-year follow-up is also included to assess rates of change in outcome measurements.

Ward, J. (2001). "Tai Chi for older people." *Nurs Older People* 13(1): 10-3.

Wang, J. S., C. Lan, et al. (2001). "Tai Chi Chuan training to enhance microcirculatory function in healthy elderly men." *Arch Phys Med Rehabil* 82(9): 1176-80.

OBJECTIVE: To evaluate cutaneous microcirculatory function in geriatric Tai Chi Chuan (TCC) practitioners. DESIGN: Case-control study. SETTING: Community setting. PARTICIPANTS: Ten elderly male TCC practitioners (mean age, 69.9 +/- 1.5 yr) and 10 sedentary men with matched age and body size (mean age, 67.0 +/- 1.0 yr). INTERVENTION: The TCC group had practiced TCC for 11.2 +/- 3.4 years (mean +/- standard error of the mean), with an exercise frequency of 5.1 +/- 1.8 times weekly. Each session included 20 minutes of warm-up, 24 minutes of TCC practice, and 10 minutes of cool down. MAIN OUTCOME MEASURES: A graded exercise test with gas analysis was conducted on a bicycle ergometer for each subject. Skin blood flow (SkBF), cutaneous vascular conductance, and skin temperature were measured at rest and during exercise testing. Plasma nitric oxide metabolite was analyzed before and immediately after exercise. RESULTS: The TCC group had a 34% higher VO₂ peak than the control group; it also had a higher SkBF, cutaneous vascular conductance, and skin temperature than the control group at rest and during exercise; and it also had a higher level of plasma nitric oxide metabolite than the sedentary group at rest and after exercise. CONCLUSION: Older TCC practitioners had higher cutaneous microcirculatory function during exercise than did their sedentary counterparts. Moreover, this change may be partially mediated by enhancement of nitric oxide release.

Taggart, H. M. (2001). "Self-reported benefits of t'ai chi practice by older women." *J Holist Nurs* 19(3): 223-32; quiz 233-7.

Self-rated health is a powerful and consistent predictor of self-care capability and health outcomes including mobility, morbidity, and mortality. Exercise is important for health and functioning of older adults. Although daily physical activity is advocated for reducing many health risks and maintaining mobility, older women are generally not heeding the message. Exercise interventions for older women should be age appropriate. T'ai chi, an ancient Chinese martial art, involves an integration of the mind and body in slow, circular movements and changes in the center of gravity. Although there is a growing body of literature on the health benefits of t'ai chi exercises, few studies focus on the self-assessment of health benefits of t'ai chi for older women. This within-participants, single-factor study of women aged 72 to 96 years resulted in statistically significant improvement in self-assessed health

as well as numerous self-reported benefits after 3 months of t'ai chi exercise participation.

Shapira, M. Y., M. Chelouche, et al. (2001). "Tai Chi Chuan practice as a tool for rehabilitation of severe head trauma: 3 case reports." *Arch Phys Med Rehabil* 82(9): 1283-5.

Rehabilitation after severe head trauma is a complex process that can be long and frustrating. New, more holistic methods for rehabilitation are constantly sought. We present the cases of 3 patients who had severe head injury and whose rehabilitation was facilitated by Tai Chi Chuan (TCC) therapy. TCC therapy should be taught only by a qualified TCC therapist and under close medical supervision.

Ritchie, J. M. (2001). "Journey into another realm. Seeking answers in energy medicine." *J Christ Nurs* 18(4): 16-7.

Nowalk, M. P., J. M. Prendergast, et al. (2001). "A randomized trial of exercise programs among older individuals living in two long-term care facilities: the FallsFREE program." *J Am Geriatr Soc* 49(7): 859-65.

OBJECTIVE: To use two different exercise programs over a 2-year period to reduce falls and their sequelae among residents of two long-term care facilities. DESIGN: Randomized, controlled trial. SETTING: The study took place at two long-term care facilities with services ranging from independent living to skilled nursing. PARTICIPANTS: One hundred and ten participants whose average age was 84 and who were capable of ambulating with or without assistive devices and could follow simple directions. INTERVENTION: Participants were randomized to one of two exercise groups (resistance/endurance plus basic enhanced programming or tai chi plus basic enhanced programming) or to a control group (basic enhanced programming only). Exercise classes were held three times per week throughout the study. MEASUREMENTS: Participants were evaluated for cognitive and physical functioning at baseline and 6, 12, and 24 months. Falls were determined from incident reports filed by the nursing staffs at the facilities. RESULTS: Time to first fall, time to death, number of days hospitalized, and incidence of falls did not differ among the treatment and control groups ($P > .05$). Among all participants, those who fell had significantly lower baseline Folstein Mini-Mental State Examination and instrumental activities of daily living scores and experienced significantly greater declines in these measures over the 2-year program. CONCLUSION: There were no significant differences in falls among the two exercise groups and the control group. Lack of treatment differences and low adherence rates suggest that residents of long-term care facilities may require individualized exercise interventions that can be adapted to their changing needs.

Li, J. X., Y. Hong, et al. (2001). "Tai chi: physiological characteristics and beneficial effects on health." *Br J Sports Med* 35(3): 148-56.

OBJECTIVES: To assess the characteristic effects of Tai Chi Chuan (TCC) exercise on metabolism and cardiorespiratory response, and to measure its effect on cardiorespiratory function, mental control, immune capacity, and the prevention of falls in elderly people. DESIGN: A review of controlled experimental studies and clinical trials designed with one of two aims: either to assess physiological responses during the performance of TCC or to assess the impact of this exercise on general health and fitness. MAIN OUTCOME MEASURES: Metabolic rate, heart rate, blood pressure, ventilation, maximal oxygen uptake (VO_2 MAX), immune capacity, falls, and fall related factors. SUBJECTS: A total of 2216 men and women. RESULTS: Under review were 31 original studies, published in Chinese or English journals, that met the criteria for inclusion. Most of the papers written in Chinese had not been introduced into the Western literature.

Nine of these studies showed that TCC can be classified as moderate exercise, as it does not demand more than 55% of maximal oxygen intake. When this form of exercise and others conducted at equal intensity were compared, TCC showed a significantly lower ventilatory equivalent (VE/VO_2 MAX). Evidence provided by cross sectional and longitudinal studies suggests that TCC exercise has beneficial effects on cardiorespiratory and musculoskeletal function, posture control capacity, and the reduction of falls experienced by the elderly. CONCLUSIONS: TCC is a moderate intensity exercise that is beneficial to cardiorespiratory function, immune capacity, mental control, flexibility, and balance control; it improves muscle strength and reduces the risk of falls in the elderly.

Li, F., P. Harmer, et al. (2001). "An evaluation of the effects of Tai Chi exercise on physical function among older persons: a randomized controlled trial." *Ann Behav Med* 23(2): 139-46.

This study was designed to determine whether a 6-month Tai Chi exercise program can improve self-reported physical functioning limitations among healthy, physically inactive older individuals. Ninety-four community residents ages 65 to 96 (Mean age = 72.8 years, SD = 5.1) volunteered to participate in the study. Participants were randomly assigned to either a 6-month experimental (Tai Chi) group (n = 49), which exercised twice per week for 60 min, or a wait-list control group (n = 45). A 6-item self-report physical functioning scale, assessing the extent of behavioral dysfunction caused by health problems, was used to evaluate change in physical functioning limitations as a result of Tai Chi intervention. Results indicated that compared to the control group, participants in the Tai Chi group experienced significant improvements in all aspects of physical functioning over the course of the 6-month intervention. Overall, the experimental group had 65% improvement across all 6 functional status measures ranging from daily activities such as walking and lifting to moderate-vigorous activities such as running. It was concluded that the 6-month Tai Chi exercise program was effective for improving functional status in healthy, physically inactive older adults. A self-paced and self-controlled activity such as Tai Chi has the potential to be an effective, low-cost means of improving functional status in older persons.

Li, F., P. Harmer, et al. (2001). "Tai Chi, self-efficacy, and physical function in the elderly." *Prev Sci* 2(4): 229-39.

Using Tai Chi as an exercise mode, this study examined the association between self-efficacy and physical function. Ninety-four healthy, physically inactive older adults (Mean age = 72.8 years, SD = 5.1) were randomly assigned to either a 6-month, twice a week, Tai Chi condition or a wait-list control condition. Outcome variables included self-reports of movement efficacy and physical function assessed at baseline, middle, and termination of the study. Multisample latent curve analyses revealed a significant rate of change attributable to the Tai Chi intervention in both self-efficacy and physical function, with participants experiencing significant improvements over the course of the intervention. Analyses also showed a positive association between self-efficacy and physical function, indicating that improvements in older adults' self-efficacy of movement as a function of Tai Chi were related to increased levels of perceived physical capability. This study uncovered the need for further exploration of the relationship between exercise self-efficacy and physical function for enhancing health-related quality of life in older adults.

Lan, C., S. Y. Chen, et al. (2001). "Heart rate responses and oxygen consumption during Tai Chi Chuan practice." *Am J Chin Med* 29(3-4): 403-10.

Tai Chi Chuan (TCC) is a popular Chinese conditioning exercise, however, its exercise intensity remains controversial. The objective of this study was to

determine the exercise intensity of Yang TCC by measuring heart rate (HR) responses and oxygen consumption (VO₂) during practice. Fifteen men aged 39.9 +/- 9.5 yrs (range 26-56 yrs) participated in this study. Subjects had practiced classical Yang TCC for 5.8 +/- 2.4 years. HR responses and VO₂ were measured during practice of TCC by using a K4 telemetry system. Blood lactate was measured before and immediately after TCC practice. Additionally, breath-by-breath measurement of cardiorespiratory function and sequential determination of blood lactate were performed during the incremental exercise of leg cycling. Measurements obtained during the TCC practice and exercise testing were compared to determine the exercise intensity of TCC. While performing TCC, the mean HR of subjects was 140 +/- 10 bpm, and the mean VO₂ was 21.4 +/- 1.5 mL x kg⁽⁻¹⁾ min⁽⁻¹⁾. Compared with the data of the exercise test, the HR during practice was 58% of the heart rate range. Meanwhile, the VO₂ during TCC practice was 55% of the VO₂ peak. Additionally, the level of blood lactate immediately after TCC practice was 3.8 mM, which reflected the level of lactate during TCC, approximated the onset of blood lactate accumulation (OBLA). The results demonstrate that TCC is an exercise with moderate intensity, and is aerobic in nature.

Gillespie, L. D., W. J. Gillespie, et al. (2001). "Interventions for preventing falls in elderly people." *Cochrane Database Syst Rev*(3): CD000340.

BACKGROUND: Approximately 30 per cent of people over 65 years of age and living in the community fall each year; the number is higher in institutions. Although less than one fall in 10 results in a fracture, a fifth of fall incidents require medical attention. OBJECTIVES: To assess the effects of interventions designed to reduce the incidence of falls in elderly people (living in the community, or in institutional or hospital care). SEARCH STRATEGY: We searched the Cochrane Musculoskeletal Group specialised register (January 2001), Cochrane Controlled Trials Register (The Cochrane Library, Issue 1, 2001), MEDLINE (1966 to February 2001), EMBASE (1988 to 2001 Week 14), CINAHL (1982 to March 2001), The National Research Register, Issue 1, 2001, Current Controlled Trials (www.controlled-trials.com accessed 25 May 2001), and reference lists of articles. We also contacted researchers in the field. SELECTION CRITERIA: Randomised trials of interventions designed to minimise the effect of, or exposure to, risk factors for falling in elderly people. Main outcomes of interest were the number of fallers, or falls. Trials reporting only intermediate outcomes were excluded. DATA COLLECTION AND ANALYSIS: Two reviewers independently assessed trial quality and extracted data. Data were pooled using the fixed effect model where appropriate. MAIN RESULTS: Interventions likely to be beneficial: ~bullet~A programme of muscle strengthening and balance retraining, individually prescribed at home by a trained health professional (3 trials, 566 participants, pooled relative risk (RR) 0.80, 95% confidence interval (95%CI) 0.66 to 0.98). ~bullet~A 15 week Tai Chi group exercise intervention (1 trial, 200 participants, risk ratio 0.51, 95%CI 0.36 to 0.73). ~bullet~Home hazard assessment and modification that is professionally prescribed for older people with a history of falling (1 trial, 530 participants, RR 0.64, 95% CI 0.49 to 0.84). A reduction in falls was seen both inside and outside the home. ~bullet~Withdrawal of psychotropic medication (1 trial, 93 participants, relative hazard 0.34, 95%CI 0.16 to 0.74). ~bullet~Multidisciplinary, multifactorial, health/environmental risk factor screening/intervention programmes, both for unselected community dwelling older people (data pooled from 3 trials, 1973 participants, pooled RR 0.73, 95%CI 0.63 to 0.86), and for older people with a history of falling, or selected because of known risk factors (data pooled from 2 trials, 713 participants, pooled RR 0.79, 95%CI 0.67 to 0.94). Interventions of unknown effectiveness: ~bullet~Group-delivered exercise interventions (9 trials, 2177 participants). ~bullet~Nutritional supplementation (1 trial, 50 participants). ~bullet~Vitamin D supplementation, with or without calcium (3 trials, 679 participants).

~bullet~Home hazard modification in association with advice on optimising medication (1 trial, 658 participants), or in association with an education package on exercise and reducing fall risk (1 trial, 3182 participants). ~bullet~Pharmacological therapy (raubasine-dihydroergocristine, 1 trial, 95 participants). ~bullet~Fall prevention programmes in institutional settings. ~bullet~Interventions using a cognitive/behavioural approach alone (2 trials, 145 participants). ~bullet~Home hazard modification for older people without a history of falling (1 trial, 530 participants). ~bullet~Hormone replacement therapy (1 trial, 116 participants). Interventions unlikely to be beneficial: ~bullet~Brisk walking in women with an upper limb fracture in the previous two years (1 trial, 165 participants). REVIEWER'S CONCLUSIONS: Interventions to prevent falls that are likely to be effective are now available; less is known about their effectiveness in preventing fall-related injuries. Costs per fall prevented have been established for four of the interventions and careful economic modelling in the context of the local healthcare system is important. Some potential interventions are of unknown effectiveness and further research is indicated.

Eliopoulos, C. (2001). "Integrative care--health benefits of Tai Chi." *Director* 9(4): 138-9.

Danusantoso, H. and L. Heijnen (2001). "Tai Chi Chuan for people with haemophilia." *Haemophilia* 7(4): 437-9.

Chen, K. M., M. Snyder, et al. (2001). "Clinical use of tai chi in elderly populations." *Geriatr Nurs* 22(4): 198-200.

Tai chi, a type of low-intensity exercise, has received growing attention in both eastern and western cultures, especially its use with the most rapidly increasing segment of the population-elders. Previous research findings further supported the idea that tai chi is appropriate for elderly populations and helps promote their well-being. In this article, the beneficial effects of tai chi for elders are summarized, resources to increase awareness about the exercise are provided, and ways to promote tai chi in elderly populations are suggested.

Chen, K. M., M. Snyder, et al. (2001). "Facilitators and barriers to elders' practice of t'ai chi. A mind-body, low-intensity exercise." *J Holist Nurs* 19(3): 238-55.

Research has documented the positive effects that t'ai chi has on the well-being of elders. However, the reasons that elders practice t'ai chi have not been explored. The purpose of this study was to describe the facilitators and barriers to t'ai chi practice in elderly populations. Taiwanese community-dwelling elders (40 of whom practiced t'ai chi and 40 who did not) aged 65 and older, matched on age and gender, were interviewed. Results showed that encouragement from others was the most important factor for elders to practice t'ai chi, whereas positive health outcomes were the reason they continued to practice it. Most of the non-t'ai chi group participants had never thought about practicing t'ai chi because they felt they were too weak to practice. Because t'ai chi can be helpful in promoting the well-being of elders, it is essential for health care professionals to overcome the barriers to its uses in elderly populations.

Beeton, K. (2001). "Tai Chi Chuan for persons with haemophilia: commentary." *Haemophilia* 7(4): 437.

Zwick, D., A. Rochelle, et al. (2000). "Evaluation and treatment of balance in the elderly: A review of the efficacy of the Berg Balance Test and Tai Chi Quan." *NeuroRehabilitation* 15(1): 49-56.

The purpose of this review of outcome studies was to determine whether the Berg Balance Test (BBT) can be considered a reliable predictor of a risk for falls in the elderly, and to review the efficacy of Tai Chi Quan in the physical therapy intervention of balance disorders in older adults as reported in the literature. The authors examined studies of the BBT, which showed that the two groups of people, fallers and non-fallers, have considerable differences among them. Fallers tended to be more variable in their characteristics as indicated by larger standard deviations. Based on these results, the authors suggest that patients who score high on the BBT should not be referred for further intervention, whereas patients who score 40 or less have a high probability of falls and require appropriate referrals. The BBT, which is relatively safe and simple, uses a quantitative scale, scoring is reproducible, and the strong internal consistency allows for easy interpretation of scores. The BBT has been shown to have moderately good sensitivity, and high specificity, and therefore is a good predictor of older adults who may have fall risks and may need assistive devices. A big challenge, then, is to plan and implement an effective treatment technique to improve balance control. One recently identified intervention is Tai Chi Quan. Tai Chi is an ancient form of exercise for fitness and the martial arts which has been practiced in China for centuries. The second part of this report examines the efficacy of Tai Chi Quan as a treatment modality. A review of studies on Tai Chi Quan indicates that it has a positive effect on improving balance in the elderly, although it has no effect on improving postural stability. The effects of Tai Chi on the treatment of balance still require extensive research. Although the articles reviewed indicate that Tai Chi does have a positive effect on balance, the methodology used in these studies needs to be improved.

Yocum, D. E., W. L. Castro, et al. (2000). "Exercise, education, and behavioral modification as alternative therapy for pain and stress in rheumatic disease." *Rheum Dis Clin North Am* 26(1): 145-59, x-xi.

Stress and pain mechanisms are complex and share many central nervous system pathways. Both are critical issues for patients with rheumatoid arthritis and other connective tissue diseases. The link between stress and neuroendocrine function suggests that alternative therapies focusing on improved psychologic and metabolic function could significantly change patients' pain outcomes. Programs using alternative therapies such as tai chi and meditation in combination with traditional medications appear to be beneficial for patients with arthritis. These individuals appear to live better lives and may have better long-term outcomes.

Naruse, K. and T. Hirai (2000). "Effects of slow tempo exercise on respiration, heart rate, and mood state." *Percept Mot Skills* 91(3 Pt 1): 729-40.

The purpose of this study was to investigate psychophysiologic responses to slow movement tempo exercise in three experiments. Exps. 1 and 2 were designed to compare slow with preferred movement tempos chosen freely by the subjects. The task movements in Exp. 1 were repetitive Arm Swinging, Stepping, and Body Swaying, performed by 14 female undergraduate students, while in Exp. 2, Body Swaying and Arm Winding were performed by 10 female undergraduate students and 13 boys and girls junior high school students. Respiration, heart rate, and scores on the State-Trait Anxiety Inventory were measured. Analysis showed respiration rates were lower during slow tempo conditions than preferred conditions. Exp. 3 was designed to compare very slow with slow movement tempos, using a Tai Chi-type of movement performed by 6 female undergraduate students. The subjects were required to synchronize the task movement with auditory stimuli, during which respiration and heart rate were measured, and a UWIST Mood-Adjective Checklist was utilized. Under the very slow movement conditions, Energetic Arousal scores were lower than those for the slow movement and the

variation of respiration between rest and task conditions corresponded inversely with the Tense Arousal scores. Together, our results suggest that slow tempo exercise does not increase physiological or psychological arousal.

Luskin, F. M., K. A. Newell, et al. (2000). "A review of mind/body therapies in the treatment of musculoskeletal disorders with implications for the elderly." *Altern Ther Health Med* 6(2): 46-56.

BACKGROUND: A comprehensive, but not systematic, review of the research on complementary and alternative treatments, specifically mind/body techniques, on musculoskeletal disease was conducted at Stanford University. The goals of the review were to establish a comprehensive literature review and provide a rationale for future research carrying the theme of "successful aging." **METHODS:** Computerized searches were conducted using MEDLINE, PsychInfo, Stanford Library, Dissertation Abstracts, Lexus-Nexus, the Internet as well as interviews conducted with practitioners and the elderly. Mind/body practices evaluated were: social support, cognitive-behavioral therapy, meditation, the placebo effect, imagery, visualization, spiritual/energy healing, music therapy, hypnosis, yoga, tai chi, and qigong. Studies published after 1990 were the priority, but when more recent literature was scarce, other controlled studies were included. **RESULTS:** Mind/body techniques were found to be efficacious primarily as complementary treatments for musculoskeletal disease and related disorders. Studies provided evidence for treatment efficacy but most apparent was the need for further controlled research. **CONCLUSIONS:** Reviewers found a dearth of randomized controlled research conducted in the US. There is a lack of studies with which to determine appropriate dosage and understand the mechanisms by which many of the practices work. Anecdotal evidence, some controlled research, clinical observation, as well as the cost effectiveness and lack of side effects of the mind/body treatments make further investigation a high priority.

Lin, Y. C., A. M. Wong, et al. (2000). "The effects of Tai Chi Chuan on postural stability in the elderly: preliminary report." *Chang Gung Med J* 23(4): 197-204.

BACKGROUND: Tai chi chuan (TCC) is a traditional Chinese conditioning exercise, consisting of a series of graceful movements linked together in a continuous sequence so that the body is constantly shifting from one foot to the other. We propose that subjects practicing TCC will have better postural control and stability than will active non-practitioners. **METHODS:** We compare static and dynamic postural controls in 14 TCC practitioners and 14 healthy active older adults using the Smart Balance Master System. The TCC group, containing 7 male and 7 female subjects (mean age, 70.9 +/- 3.3 years), had been practicing TCC regularly for 2 to 35 years. The control group included 4 male and 10 female healthy and active older subjects (mean age, 69.1 +/- 3.1 years), with age and body size matched to the TCC group. **RESULTS:** The results of static postural control tests showed no differences between the TCC and control groups under simple conditions (eyes open, eyes closed, swaying vision, and eyes open with swaying surface), but in the more complicated conditions (eyes closed with sway-referenced support and sway-referenced vision and support), the TCC group had significantly better results than the control group. In the dynamic balance test, the TCC group had significantly better results only in the rhythmic forward-backward weight-shifting test. **CONCLUSION:** Our data demonstrate that regular TCC practitioners have better postural stability, especially in the more complicated conditions with disturbed visual and somatosensory conditions.

Lewis, D. E. (2000). "T'ai chi ch'uan." *Complement Ther Nurs Midwifery* 6(4): 204-6.

The Chinese practice of t'ai chi seems to be receiving increased interest in the West. This article gives a brief overview of t'ai chi, including its

origins, development, principles and potential health benefits. The function of the essential elements of t'ai chi, namely the Form and chi kung are described and their potential benefits for patients and nurses are discussed. Exponents of t'ai chi believe that it has health benefits on physical, psychological and spiritual levels, thus promoting a feeling of well-being. In addition, regular practitioners are empowered to be in greater control of themselves, their health, and situations in which they find themselves.

Lan, C., J. S. Lai, et al. (2000). "Tai Chi Chuan to improve muscular strength and endurance in elderly individuals: a pilot study." *Arch Phys Med Rehabil* 81(5): 604-7.

OBJECTIVE: To evaluate the training effect of a Tai Chi Chuan (TCC) program on knee extensor muscular strength and endurance in elderly individuals. DESIGN: Before-after trial. SETTING: Community setting. PARTICIPANTS: Forty-one community dwelling subjects aged 61.1 +/- 9.8 years undertook a TCC program. Nine dropped out during the study. Pretraining and posttraining measurements were obtained from 15 men and 17 women. INTERVENTION: Subjects participated in a 6-month TCC program. Each session consisted of 20 minutes of warm-up, 24 minutes of structured TCC training, and 10 minutes of cool-down exercises. MAIN OUTCOME MEASURES: Peak torque of dominant and nondominant knee extensors was tested at speeds of 60 degrees , 180 degrees , and 240 degrees/sec concentrically and eccentrically. Muscular endurance of the knee extensor was tested at the speed of 180 degrees /sec. RESULTS: In the group of men, concentric knee extensor peak torque increased by 15.1% to 20.0% and eccentric peak torque increased by 15.1% to 23.7%. The group of women also showed increases, ranging from 13.5% to 21.8% in concentric peak torque, and 18.3% to 23.8% in eccentric peak torque. In addition, the knee extensor endurance ratio increased by 9.6% to 18.8% in the men and 10.1% to 14.6% in the women. CONCLUSION: TCC training may enhance muscular strength and endurance of knee extensors in elderly individuals.

Hong, Y., J. X. Li, et al. (2000). "Balance control, flexibility, and cardiorespiratory fitness among older Tai Chi practitioners." *Br J Sports Med* 34(1): 29-34.

BACKGROUND: Tai Chi Chuan (TCC) exercise has beneficial effects on the components of physical condition and can produce a substantial reduction in the risk of multiple falls. Previous studies have shown that short term TCC exercise did not improve the scores in the single leg stance test with eyes closed and the sit and reach test. There has apparently been no research into the effects of TCC on total body rotation flexibility and heart rate responses at rest and after a three minute step test. METHODS: In this cross sectional study, 28 male TCC practitioners with an average age of 67.5 years old and 13.2 years of TCC exercise experience were recruited to form the TCC group. Another 30 sedentary men aged 66.2 were selected to serve as the control group. Measurements included resting heart rate, left and right single leg stance with eyes closed, modified sit and reach test, total body rotation test (left and right), and a three minute step test. RESULTS: Compared with the sedentary group, the TCC group had significantly better scores in resting heart rate, three minute step test heart rate, modified sit and reach, total body rotation test on both right and left side ($p < 0.01$), and both right and left leg standing with eyes closed ($p < 0.05$). According to the American Fitness Standards, the TCC group attained the 90th percentile rank for sit and reach and total body rotation test, right and left. CONCLUSION: Long term regular TCC exercise has favourable effects on the promotion of balance control, flexibility, and cardiovascular fitness in older adults.

Fontana, J., C. Colella, et al. (2000). "T'ai Chi Chih as an intervention for heart failure." *Nursing Clinics of North America* 35(4): 1031-1046.

Twelve week class with N=5; Case Study

Bunyan, L. E. (2000). "Tai chi and the art of downsizing." *Natl Netw* 25(2): 6-7, 27.

(2000). "Tai chi: meditative movement for health." *Harv Womens Health Watch* 8(4): 6.