

### **Falls prevention: a compiled list of resources**

(Compiled as part of the one-to-one support for Birmingham)

Archibald, R. (2002). "Falls in older people: Risk factors and strategies for prevention." Ergonomics **45**(9): 668-669.

Ballinger, C. and L. Clemson (2007). "The selection of and adherence to falls prevention strategies: Perspectives of older people." Disability and Rehabilitation **29**(20-21): 26.

Banez, C., S. Tully, et al. (2008). "Development, implementation, and evaluation of an Interprofessional Falls Prevention Program for older adults." Journal of the American Geriatrics Society **56**(8): 1549-1555.

This article describes the development and implementation of an Interprofessional Falls Prevention Program (IFPP) designed for community-dwelling seniors. The program was a collaborative pilot research study conducted in a retirement home and an Outpatient hospital setting. The pilot was successful and was positioned into a permanent falls prevention program. The IFPP aimed at improving physical function and balance and reducing the fear of falling in seniors with a history of falls. The pilot study included an interprofessional falls assessment followed by a 12-week program of once-weekly group education and exercise sessions, 3- and 6-month follow-up visits, and individual counseling. To measure program effectiveness, the Berg Balance Scale, the Timed Up and Go Test, the Falls Efficacy Scale, and the Morse Fall Risk Scale were used at baseline, upon program completion, and at 3- and 6-month follow-up. Process measures were also collected, including patient satisfaction. Persistent improvements were found in participants' balance, strength, functional mobility, and fear of falling. Patient satisfaction with the program was high. Challenges faced in program implementation are also highlighted.

Barnett, L., E. van Beurden, et al. (2003). "Falls prevention in rural general practice: what stands the test of time and where to from here?" Australian and New Zealand Journal of Public Health **27**(5): 481-485.

Objective: General practitioner recall of the 1992-96 'Stay on Your Feet'(SOYF) program and its influence on practice were surveyed five years post-intervention to gauge sustainability of the SOYF General Practice (GP) component. Methods: A survey assessed which SOYF components were still in existence, current practice related to falls prevention, and interest in professional development. All general practitioners (GPs) situated within the boundaries of a rural Area Health Service were mailed a survey in late 2001. Results: Response rate was 66.5% (139/ 209). Of 117 GPs in practice at the time of SOYF, 80.2% reported having heard of SOYF and 74.4% of those felt it had influenced practice. Half (50.9%) still had a copy of the SOYF GP resource and of those, 58.6% used it at least 'occasionally'. Three-quarters of GPs surveyed (75.2%) checked medications 'most/almost all' of the time with patients over 60 years; 46.7% assessed falls risk factors; 41.3% gave advice; and 22.6% referred to allied health practitioners. GPs indicated a strong interest in falls prevention- related professional development. There was no significant association between use of the SOYF resource package and any of the current falls prevention practices (all  $\chi^2 > 0.05$ ). Conclusions and implications: There was high recall of

SOYF and a general belief that it influenced practice. There was little indication that use of the resource had any lasting influence on GPs' practices. In future, careful thought needs to go into designing a program that has potential to affect long-term change in GPs' falls prevention practice.

Barrett, J. A., M. Bradshaw, et al. (2004). "Reduction of falls-related injuries using a hospital inpatient falls prevention program." Journal of the American Geriatrics Society **52**(11): 1969-1970.

Batchelor, F. A., K. D. Hill, et al. (2009). "The FLASSH study: protocol for a randomised controlled trial evaluating falls prevention after stroke and two sub-studies." Bmc Neurology **9**.

Background: Falls are common in stroke survivors returning home after rehabilitation, however there is currently a lack of evidence about preventing falls in this population. This paper describes the study protocol for the FLASSH (FaLls prevention After Stroke Survivors return Home) project. Methods and design: This randomised controlled trial aims to evaluate the effectiveness of a multi-factorial falls prevention program for stroke survivors who are at high risk of falling when they return home after rehabilitation. Intervention will consist of a home exercise program as well as individualised falls prevention and injury minimisation strategies based on identified risk factors for falls. Additionally, two sub-studies will be implemented in order to explore other key areas related to falls in this population. The first of these is a longitudinal study evaluating the relationship between fear of falling, falls and function over twelve months, and the second evaluates residual impairment in gait stability and obstacle crossing twelve months after discharge from rehabilitation. Discussion: The results of the FLASSH project will inform falls prevention practice for stroke survivors. If the falls prevention program is shown to be effective, low cost strategies to prevent falls can be implemented for those at risk around the time of discharge from rehabilitation, thus improving safety and quality of life for stroke survivors. The two sub-studies will contribute to the overall understanding and management of falls risk in stroke survivors. Trial registration: This trial is registered with the Australian and New Zealand Clinical Trials Registry (ACTRN012607000398404).

Beard, J., D. Rowell, et al. (2006). "Economic analysis of a community-based falls prevention program." Public Health **120**(8): 742-751.

Objectives: To undertake a cost-benefit analysis of 'Stay on Your Feet', a community-based falls prevention program targeting older people at all levels of risk in New South Wales, Australia. Hospital separations were monitored in the intervention region, a control region and for the state of New South Wales as a whole. Changing admission patterns over the intervention period were used to assess the impact of the program. Methods: Cost-benefit analysis compared the costs of the program with two estimates of savings from avoided hospital admissions. The first compared the cost of hospital admissions in the intervention region to a control region of similar demographics, while the second compared hospital utilization in the intervention region with the state of New South Wales as a whole using falls-related hospital diagnosis related group (DRG) codes. Results: The total direct costs of the program were estimated at A\$781 829. Both methods identified clear overall net benefits ranging from A\$5.4 million for avoided hospitalizations alone to A\$16.9 million for all avoided direct and indirect costs. The

confidence intervals around these estimates were small. The average overall benefit to cost ratio for the intervention as a whole was 20.6:1. Conclusions: These findings suggest that well-designed community-based interventions targeting falls prevention among older people are highly cost effective and a wise investment for all levels of government. The models used are conservative and are likely to underestimate the real benefit of the intervention, which may have lasted for some time beyond the life of the program. (c) 2006 The Royal Institute of Public Health. Published by Elsevier Ltd. All rights reserved.

Begg, R. K. and W. A. Sparrow (2000). "Gait characteristics of young and older individuals negotiating a raised surface: Implications for the prevention of falls." Journals of Gerontology Series a-Biological Sciences and Medical Sciences **55**(3): M147-M154.

Background. Falls in older individuals are a major public health issue because of the financial cost of surgery and rehabilitation and the human cost of associated pain and disability. Older individuals are most likely to fall when negotiating an obstacle or obstruction during locomotion. This research was aimed at investigating lower limb motion while a subject negotiated a raised surface. Methods. The gait of six healthy young (Y) women (mean age 23.1 years) and six healthy older (O) women (mean age 67.6 years) were analyzed with a PEAK motion analyzer and a dual-force-platform system during unobstructed walking and when the subjects were stepping on and off a raised surface of 15 cm. The effect of age on foot clearance and force platform variables was analyzed. Results. During stepping on, the young women cleared the step by the lead foot by a significantly greater margin than the older subjects did (Y = 10.6 cm, O = 9.1 cm;  $p < .05$ ) but trail-foot clearance was not significantly different (Y = 9.4 cm, O = 8.8 cm). Foot clearance in stepping off was low compared with that of ascent, and the older individuals had a significantly higher lead (Y = 1.5 cm, O = 3.3 cm,  $p < .05$ ) and trail (Y = 1.0 cm, O = 2.1 cm) vertical clearance. Older individuals positioned both the lead and the trail foot relatively farther from the step edge on ascending a raised surface, respectively, Y = 87% and O = 93% of the step cycle and Y = 29% and O = 34%. Foot placement in descent was qualitatively similar for the two groups. The force and the impulse data under the lead and the trail feet confirm modulations consistent with the foot clearance data. Conclusion. In negotiating a raised surface older individuals appear to use a nonoptimal foot placement strategy in which, compared with that of young subjects, the trail foot is placed a long way from the edge of the step. The older subjects allowed very little correction time and little latitude in foot placement beyond the edge of the step, suggesting that the approach to the obstacle may be a critical determinant of safety.

Bishop, F., L. Yardley, et al. (2005). "Attitudes towards and beliefs about falls prevention interventions in 7 European countries: A framework analysis." Psychology & Health **20**: 28-29.

Bloch, F., D. Jegou, et al. (2009). "Do ED staffs have a role to play in the prevention of repeat falls in elderly patients?" American Journal of Emergency Medicine **27**(3): 303-307. Background: Fall-related morbidity is a serious public health issue in older adults referred to emergency departments (EDs). Emergency physicians mostly focus on immediate injuries, whereas the specific assessment of functional consequences and opportunities for prevention remain scarce. The aim of this study was to determine the factors influencing 6-month independence. Methods: We used a prospective

observational study at the ED of a tertiary teaching hospital over a 6-month period. Uni- and multivariate assessments of factors related to loss of independence were examined. Results: A total of 367 patients survived to 6 months, mean age was 86 years, and 79% were women. The Population was initially healthy and independent. Because this independence reassured the medical staff, more than 42% percent were directly discharged home without any improvement of home facilities; only 63% had recovered their independence at the end of the follow-up. There were 111 patients were hospitalized for 30 days or more. Older patients initial Katz score, and absence of immediate trauma consequences were associated with an increased risk for loss of independence. Conclusions: Because prevention is an emerging role of ED, a multidisciplinary team should evaluate fallers and propose medical and environmental changes as required for those discharged after their ED visit. (C) 2009 Elsevier Inc. All rights reserved.

Bonner, A. (2005). "Falls in older people: Prevention & management, 3rd edition." Geriatric Nursing **26**(5): 287-288.

Bonner, A. (2005). "Falls in older people: Risk factors and strategies for prevention." Geriatric Nursing **26**(5): 287-288.

Brady, R. and V. Lamb (2008). "Assessment, intervention, and prevention of falls in elders with developmental disabilities." Topics in Geriatric Rehabilitation **24**(1): 54-63.

Falls are the leading cause of injury and death in older adults in the United States. People with developmental disabilities experience accelerated physiologic and degenerative changes associated with aging and are at risk for falls sooner than the general population. There is little information specifically regarding the evaluation and prevention of falls for individuals with developmental disabilities. This article examines how the strategies used to evaluate and prevent falls in the general population translate to use in adults with developmental disabilities and highlights the research that indicates how risk factors, evaluation, interventions, and prevention strategies may differ for people with developmental disabilities.

Brown, R. (2004). "How to start and sustain a falls prevention program for seniors led by senior volunteers." Journal of Aging and Physical Activity **12**(3): 253-254.

Bruce, S. A., D. Skelton, et al. (2006). Responses to perturbations of gait while walking on a treadmill in older females after a falls prevention programme. Annual Meeting of the American-Geriatrics-Society, Chicago, IL.

Bunn, F., A. Dickinson, et al. (2008). "A systematic review of older people's perceptions of facilitators and barriers to participation in falls-prevention interventions." Ageing & Society **28**: 449-472.

The prevention of falls is currently high on the health policy agenda in the United Kingdom, which has led to the establishment of many falls-prevention services. If these are to be effective, however, the acceptability of services to older people needs to be considered. This paper reports a systematic review Of Studies of older people's perceptions of these interventions. The papers for review were identified by searching electronic databases, checking reference lists, and contacting experts. Two authors independently screened the studies and extracted data on the factors relating to participation in, or adherence to, falls-prevention strategies. Twenty-four

studies were identified, of which 12 were qualitative. Only one study specifically examined interventions that promote participation in falls-prevention programmes; the others explored older people's attitudes and views. The factors that facilitated participation included social support, low intensity exercise, greater education, involvement in decision-making, and a perception of the programmes as relevant and life-enhancing. Barriers to participation included fatalism, denial and under-estimation of the risk of falling, poor self-efficacy, no previous history of exercise, fear of falling, poor health and functional ability, low health expectations and the stigma associated with programmes that targeted older people.

Cahall, M., R. N. Jerome, et al. (2008). "The impact of a literature consult service on geriatric clinical care and training in falls prevention." Journal of the Medical Library Association **96**(2): 88-100.

Cameron, I. (2001). "Falls in Older People: Risk factors and strategies for prevention." Australian and New Zealand Journal of Public Health **25**(3): 278-278.

Canning, C. G., C. Sherrington, et al. (2009). "Exercise therapy for prevention of falls in people with Parkinson's disease: A protocol for a randomised controlled trial and economic evaluation." Bmc Neurology **9**.

Background: People with Parkinson's disease are twice as likely to be recurrent fallers compared to other older people. As these falls have devastating consequences, there is an urgent need to identify and test innovative interventions with the potential to reduce falls in people with Parkinson's disease. The main objective of this randomised controlled trial is to determine whether fall rates can be reduced in people with Parkinson's disease using exercise targeting three potentially remediable risk factors for falls (reduced balance, reduced leg muscle strength and freezing of gait). In addition we will establish the cost effectiveness of the exercise program from the health provider's perspective. Methods/Design: 230 community-dwelling participants with idiopathic Parkinson's disease will be recruited. Eligible participants will also have a history of falls or be identified as being at risk of falls on assessment. Participants will be randomly allocated to a usual-care control group or an intervention group which will undertake weight-bearing balance and strengthening exercises and use cueing strategies to address freezing of gait. The intervention group will choose between the home-based or support group-based mode of the program. Participants in both groups will receive standardized falls prevention advice. The primary outcome measure will be fall rates. Participants will record falls and medical interventions in a diary for the duration of the 6-month intervention period. Secondary measures include the Parkinson's Disease Falls Risk Score, maximal leg muscle strength, standing balance, the Short Physical Performance Battery, freezing of gait, health and well being, habitual physical activity and positive and negative affect schedule. Discussion: No adequately powered studies have investigated exercise interventions aimed at reducing falls in people with Parkinson's disease. This trial will determine the effectiveness of the exercise intervention in reducing falls and its cost effectiveness. This pragmatic program, if found to be effective, has the potential to be implemented within existing community services. Trial registration: The protocol for this study is registered with the Australian New Zealand Clinical Trials Registry (ACTRN12608000303347).

Capezuti, E. (2004). "Building the science of falls-prevention research." Journal of the

American Geriatrics Society **52**(3): 461-462.

Carter, N. D., P. Kannus, et al. (2001). "Exercise in the prevention of falls in older people - A systematic literature review examining the rationale and the evidence." Sports Medicine **31**(6): 427-438.

Falls are a major source of death and injury in elderly people. For example, they cause 90% of hip fractures and the current cost of hip fractures in the US is estimated to be about 10 billion dollars. Age-related changes in the physiological systems (somatosensory, vestibular and visual) which contribute to the maintenance of balance are well documented in older adults. These changes coupled with age-related changes in muscle and bone are likely to contribute to an increased risk of falls in this population. The integrated rehabilitation-based model of fall risk factors reveals multiple sites for interventions that may reverse fall risk factors. Regular exercise may be one way of preventing falls and fall-related fractures. The evidence for this contention comes from a variety of sources. On the basis of 9 randomised controlled studies conducted since 1996, exercise appears to be a useful tool in fall prevention in older adults, significantly reducing the incidence of falls compared with control groups. However, current limitations such as inconsistencies in the measurement of key dependent and independent variables do not, at present, permit a meta-analysis of intervention trials. Further investigation, using trials designed with the current limitations in mind, is necessary to establish the optimum exercise programme to maximise fall prevention in older adults.

Casteel, C., C. Peek-Asa, et al. (2004). "Evaluation of a falls prevention program for independent elderly." American Journal of Health Behavior **28**: S51-S60.

Objective: To evaluate the effectiveness of an older adult falls-prevention program and describe compliance with the program. Methods: The No More Falls! program was evaluated by comparing outcomes of program participants and nonparticipants from the same health care system and by comparing outcomes in pre- and postintervention periods. Results: Program participants were 20% less likely to fall than nonparticipants. Falls during the year after program participation decreased 53%, compared with a 21% decline among nonparticipants. Compliance was positively associated with program effectiveness. Conclusion: These findings suggest that the No More Falls! program was successful in reducing falls among older adults.

Chang, J. T., S. C. Morton, et al. (2004). "Interventions for the prevention of falls in older adults: systematic review and meta-analysis of randomised clinical trials." British Medical Journal **328**(7441): 680-683.

Objective To assess the relative effectiveness of interventions to prevent falls in older adults to either a usual care group or control group. Design Systematic review and meta-analyses. Data sources Medline, HealthSTAR, Embase, the Cochrane Library, other health related databases, and the reference lists from review articles and systematic reviews. Data extraction Components of falls intervention: multifactorial falls risk assessment with management programme, exercise, environmental modifications, or education. Results 40 trials were identified. A random effects analysis combining trials with risk ratio data showed a reduction in the risk of falling (risk ratio 0.88, 95% confidence interval 0.82 to 0.95), whereas combining trials with incidence rate data showed a reduction in the monthly rate of falling (incidence rate ratio 0.80, 0.72 to 0.88). The effect of individual components was assessed by meta-regression. A multifactorial falls risk assessment and

management programme was the most effective component on risk of falling (0.82, 0.72 to 0.94, number needed to treat 11) and monthly fall rate (0.63, 0.49 to 0.83; 11.8 fewer falls in treatment group per 100 patients per month). Exercise interventions also had a beneficial effect on the risk of falling (0.86, 0.75 to 0.99, number needed to treat 16) and monthly fall rate (0.86, 0.73 to 1.01; 2.7). Conclusions Interventions to prevent falls in older adults are effective in reducing both the risk of falling and the monthly rate of falling. The most effective intervention was a multifactorial falls risk assessment and management programme. Exercise programmes were also effective in reducing the risk of falling.

Chi, C. F., T. C. Chang, et al. (2003). Accident patterns and prevention measures for fatal occupational falls in the construction industry. 3rd International Symposium on Ergonomics in Building and Construction held at Triennial Congress of the International-Ergonomics-Association, Seoul, SOUTH KOREA.

Contributing factors to 621 occupational fatal falls have been identified with respect to the victim's individual factors, the fall site, company size, and cause of fall. Individual factors included age, gender, experience, and the use of personal protective equipment (PPE). Accident scenarios were derived from accident reports. Significant linkages were found between causes for the falls and accident events. Falls from scaffold staging were associated with a lack of complying scaffolds and bodily action. Falls through existing floor openings were associated with unguarded openings, inappropriate protections, or the removal of protections. Falls from building girders or other structural steel were associated with bodily actions and improper use of PPE. Falls from roof edges were associated with bodily actions and being pulled down by a hoist, object or tool. Falls through roof surfaces were associated with lack of complying scaffolds. Falls from ladders were associated with overexertion and unusual control and the use of unsafe ladders and tools. Falls down stairs or steps were associated with unguarded openings. Falls while jumping to a lower floor and falls through existing roof openings were associated with poor work practices. Primary and secondary prevention measures can be used to prevent falls or to mitigate the consequences of falls and are suggested for each type of accident. Primary prevention measures would include fixed barriers, such as handrails, guardrails, surface opening protections (hole coverings), crawling boards/planks, and strong roofing materials. Secondary protection measures would include travel restraint systems (safety belt), fall arrest systems (safety harness), and fall containment systems (safety nets). (c) 2005 Elsevier Ltd. All rights reserved.

Close, J., R. Hooper, et al. (2000). "Predictors of falls in a high rise population - Results from the prevention of falls in the elderly trial (PROFET)." Journal of the American Geriatrics Society **48**(8): P275.

Close, J. C. T. (2005). "Prevention of falls in older people." Disability and Rehabilitation **27**(18-19): 1061-1071.

In recent years the evidence base for prevention of falls in older people has increased and associated with this has been an inevitable expansion in clinical services which attempt to localize and implement what is described in the literature. This article reviews the basic physiology implicit in maintenance of the upright posture; highlights the diversity of medical and non-medical risk factors associated with falls; describes the clinical assessment of an older person at risk of falls; reviews the evidence for intervention in the prevention of falls in older people; and

acknowledges the need for a clear strategic direction to successfully prevent falls and the requirement for ongoing research as well as much needed service evaluation.

Close, J. C. T., R. Hooper, et al. (2003). "Predictors of falls in a high risk population: results from the prevention of falls in the elderly trial (PROFET)." Emergency Medicine Journal **20**(5): 421-425.

Objectives: The prevention of falls in the elderly trial (PROFET) provides evidence of the benefits of structured interdisciplinary assessment of older people presenting to the accident and emergency department with a fall. However, the service implications of implementing this effective intervention are significant. This study therefore examined risk factors from PROFET and used these to devise a practical approach to streamlining referrals from accident and emergency departments to specialist falls services. Methods: Logistic regression analysis was used in the control group to identify patients with an increased risk of falling in the absence of any intervention. The derived predictors were investigated to see whether they also predicted loss to follow up. A second regression analysis was undertaken to test for interaction with intervention. Results: Significant positive predictors of further falls were; history of falls in the previous year (OR 1.5 (95% CI 1.1 to 1.9)), falling indoors (OR 2.4 (95% CI 1.1 to 5.2)), and inability to get up after a fall (OR 5.5 (95% CI 2.3 to 13.0)). Negative predictors were moderate alcohol consumption (OR 0.55 (95% CI 0.28 to 1.1)), a reduced abbreviated mental test score (OR 0.7 (95% CI 0.53 to 0.93)), and admission to hospital as a result of the fall (OR 0.26 (95% CI 0.11 to 0.61)). A history of falls (OR 1.2 (95% CI 1.0 to 1.3)), falling indoors (OR 3.2 (95% CI 1.5 to 6.6)) and a reduced abbreviated mental test score (OR 1.3 (95% CI 1.0 to 1.6)) were found to predict loss to follow up. Conclusions: The study has focused on a readily identifiable high risk group of people presenting at a key interface between the primary and secondary health care sectors. Analysis of derived predictors offers a practical risk based approach to streamlining referrals that is consistent with an attainable level of service commitment.

Colon-Emeric, C., A. Schenck, et al. (2005). "Translating interdisciplinary falls prevention into clinical practice: Results from a quality improvement collaborative." Gerontologist **45**: 387-387.

Colon-Emeric, C., A. Schenck, et al. (2006). "Translating evidence-based falls prevention into clinical practice in nursing facilities: Results and lessons from a quality improvement collaborative." Journal of the American Geriatrics Society **54**(9): 1414-1418.

OBJECTIVES: To describe the changes in process of care before and after an evidence-based fall reduction quality improvement collaborative in nursing facilities. DESIGN: Natural experiment with nonparticipating facilities serving as controls. SETTING: Community nursing homes. PARTICIPANTS: Thirty-six participating and 353 nonparticipating nursing facilities in North Carolina. INTERVENTION: Two in-person learning sessions, monthly teleconferences, and an e-mail discussion list over 9 months. The change package emphasized screening, labeling, and risk-factor reduction. MEASUREMENTS: Compliance was measured using facility self-report and chart abstraction (n=832) before and after the intervention. Fall rates as measured using the Minimum Data Set (MDS) were compared with those of nonparticipating facilities as an exploratory outcome. RESULTS: Self-reported compliance with screening, labeling, and risk-factor reduction approached 100%. Chart abstraction revealed only modest improvements in screening (51% to 68%, P <.05), risk-factor

reduction (4% to 7%,  $P=.30$ ), and medication assessment (2% to 6%,  $P=.34$ ). There was a significant increase in vitamin D prescriptions (40% to 48%,  $P=.03$ ) and decrease in sedative-hypnotics (19% to 12%,  $P=.04$ ) but no change in benzodiazepine, neuroleptic, or calcium use. No significant changes in proportions of fallers or fall rates were observed according to chart abstraction (28.6% to 37.5%,  $P=.17$ ), MDS (18.2% to 15.4%,  $P=.56$ ), or self-report (6.1-5.6 falls/1,000 bed days,  $P=.31$ ). CONCLUSION: Multiple-risk-factor reduction tasks are infrequently implemented, whereas screening tasks appear more easily modifiable in a real-world setting. Substantial differences between self-reported practice and medical record documentation require that additional data sources be used to assess the change-in-care processes resulting from quality improvement programs. Interventions to improve interdisciplinary collaboration need to be developed.

Comans, T., S. Brauer, et al. (2009). "A break-even analysis of a community rehabilitation falls prevention service." Australian and New Zealand Journal of Public Health **33**(3): 240-245.

Objective: To identify and compare the minimum number of clients that a multidisciplinary falls prevention service delivered through domiciliary or centre-based care needs to treat to allow the service to reach a 'break-even' point. Method: A break-even analysis was undertaken for each of two models of care for a multidisciplinary community rehabilitation falls prevention service. The two models comprised either a centre-based group exercise and education program or a similar program delivered individually in the client's home. The service consisted of a physiotherapist, occupational therapist and therapy assistant. The participants were adults aged over 65 years who had experienced previous falls. Costs were based on the actual cost of running a community rehabilitation team located in Brisbane. Benefits were obtained by estimating the savings gained to society from the number of falls prevented by the program on the basis of the falls reduction rates obtained in similar multidisciplinary programs. Results: It is estimated that a multidisciplinary community falls prevention team would need to see 57 clients per year to make the service break-even using a centre-based model of care and 78 clients for a domiciliary-based model. Conclusions and Implications: The service this study was based on has the capability to see around 300 clients per year in a centre-based service or 200-250 clients per year in a home-based service. Based on the best available estimates of costs of falls, multidisciplinary falls prevention teams in the community targeting people at high risk of falls are worthwhile funding from a societal viewpoint.

Costello, E. and J. E. Edelman (2008). "Update on falls prevention for community-dwelling older adults: Review of single and multifactorial intervention programs." Journal of Rehabilitation Research and Development **45**(8): 1135-1152.

The incidence of falls, fall-related injuries, and fall-associated costs continue to rise along with the increase in the aging population. Community-based fall prevention programs for the elderly are proliferating in an attempt to address this health problem. Prevention programs vary widely in their scope, ranging from single intervention strategies to comprehensive multifactorial approaches. Programs have been offered to targeted groups of elderly individuals at high risk for falls and to nonselect groups of community-dwelling elderly adults. This article presents a review of randomized controlled trials that investigated the effectiveness of fall prevention programs for community-dwelling older adults. Following a comprehensive critical

analysis of the literature, we present the following guidelines: (1) multifactorial fall prevention programs appear to be more effective for older individuals with a previous fall history versus a nonselect group; (2) medication and vision assessment with appropriate health practitioner referral should be included in a falls screening examination; (3) exercise alone is effective in reducing falls and should include a comprehensive program combining muscle strengthening, balance, and/or endurance training for a minimum of 12 weeks; and (4) home hazard assessment with modifications may be beneficial in reducing falls, especially in a targeted group of individuals.

Crome, P., S. Hill, et al. (2000). "A randomised controlled trial of a nurse led falls prevention clinic." Journal of the American Geriatrics Society **48**(8): P269.

Cumming, R. G. (2002). "Intervention strategies and risk-factor modification for falls prevention - A review of recent intervention studies." Clinics in Geriatric Medicine **18**(2): 175-+.

Twenty-one randomized trials of falls prevention interventions were reviewed. These trials clearly demonstrate that many falls can be prevented. The most effective interventions are those that are multifactorial and target people at high risk of falling who live in the community. There is convincing evidence that exercise can prevent falls but the best type of exercise remains unknown. Reducing use of psychotropic medications will prevent falls but the value of home modifications is still uncertain.

Cumming, R. G., M. Thomas, et al. (2001). "Adherence to occupational therapist recommendations for home modifications for falls prevention." American Journal of Occupational Therapy **55**(6): 641-648.

Objective. This study examined adherence to home modification recommendations made by an occupational therapist and attempted to identify predictors of adherence. Method. An experienced occupational therapist visited the homes of 178 people (mean age = 76.4years) to evaluate for and recommend appropriate home modifications for falls prevention. One year later, a research assistant visited these persons' homes to assess adherence. Results. At least one home modification was recommended in 150 of the 178 homes visited. The most common recommendations were to remove mats and throw rugs (48%), to change footwear (24%), and to use a nonslip bathmat (21%). In the, 121 homes revisited after 12 months, 419 home modifications had been recommended, and 216 (52%) were met with partial or complete adherence. The only significant predictors of adherence were a belief that home modifications can prevent falls and having help at home from relatives. Conclusion. A major barrier to adherence to home modification recommendations is that many older people do not believe that home modifications can reduce their risk of falling.

Day, L. (2003). "Falls in older people: Risk factors and strategies for prevention." Injury Prevention **9**(1): 93-94.

Day, L., B. Fildes, et al. (2002). "Randomised factorial trial of falls prevention among older people living in their own homes." British Medical Journal **325**(7356): 128-131.

Objective To test the effectiveness of, and explore interactions between, three interventions to prevent falls among older people. Design A randomised controlled trial with a full factorial design. Setting Urban community in Melbourne, Australia.

Participants 1090 aged 70 years and over and living at home. Most were Australian born and rated their health as good to excellent; just over half lived alone. Interventions Three interventions (group based exercise, home hazard management, and vision improvement) delivered to eight groups defined by the presence or absence of each intervention. Main outcome measure Time to first fall ascertained by an 18 month falls calendar and analysed with survival analysis techniques. Changes to targeted risk factors were assessed by using measures of quadriceps strength, balance, vision, and number of hazards in the home. Results The rate ratio for exercise was 0.82 (95% confidence interval 0.70 to 0.97,  $P=0.02$ ), and a significant effect ( $P < 0.05$ ) was observed for the combinations of interventions that involved exercise. Balance measures improved significantly among the exercise group. Neither home hazard management nor treatment of poor vision showed a significant effect. The strongest effect was observed for all three interventions combined (rate ratio 0.67 (0.51 to 0.88,  $P=0.004$ )), producing an estimated 14.0% reduction in the annual fall rate. The number of people needed to be treated to prevent one fall a year ranged from 32 for home hazard management to 7 for all three interventions combined. Conclusions Group based exercise was the most potent single intervention tested, and the reduction in falls among this group seems to have been associated with improved balance. Falls were further reduced by the addition of home hazard management or reduced vision management, or both of these. Cost effectiveness is yet to be examined. These findings are most applicable to Australian born adults aged 70-84 years living at home who rate their health as good.

Deery, H. A., L. M. Day, et al. (2000). "An impact evaluation of a falls prevention program among older people." Accident Analysis and Prevention **32**(3): 427-433.

The aim of this evaluation study was to assess the impact of peer-presented education sessions on the falls-related attitude, knowledge and behaviour of older people. The evaluation was undertaken on the Bellarine Peninsula in Victoria, Australia, and adopted a non-randomised pre-test post-test design. Baseline, 3 and 12 months follow-up data were collected for 107 individuals who attended the education sessions and 116 controls, matched by age range and sex. The groups were not strictly equivalent at baseline, with the intervention group having a greater knowledge about falls and falls prevention. Analyses which controlled for baseline differences showed that those who attended the education sessions maintained a greater knowledge of factors that can prevent falls at 12 months follow-up. The intervention group also made more changes in and around their home to prevent falls by 3 and 12 months follow-up. Younger participants who reported a previous history of falls and having taken action to prevent falls were most likely to take additional action. The results can help target this type of education program and suggest that their major benefit may lie in providing those who voluntarily attend with the impetus to take the most effective preventative action. (C) 2000 Elsevier Science Ltd. All rights reserved.

Dempsey, J. (2004). "Falls prevention revisited: a call for a new approach." Journal of Clinical Nursing **13**(4): 479-485.

Background. Patient falls constitute a major threat to health services' ability to provide care. Previous studies confirm that nurses can identify patients at risk and that a preventative programme can reduce the rate of falls but few studies have been evaluated over time. Aims and objectives. A study was undertaken to test a Falls Prevention Programme in an acute medical area that was re-evaluated 5 years

later to determine if the effects were sustainable. Design. The design included two groups of patients admitted before and after the programme. Variables such as staffing, equipment, environment and routines were controlled. However, because of ethical approval constraints, some variables such as age, mental status, mobility and gender were not. Methods. The programme included a risk assessment tool, a choice of interventions, a graphic that alerted others to 'at risk patients' and simple patient and staff education. Data were collected using incident forms and a formula was used to calculate a rate of falls. A non-paired t-test compared rates and ANOVA examined the relationship of age, gender, mobility and mental status on the incidence of falls. Control graphs determined the stability of the process. Results. The falls rate was significantly reduced. Control graphs demonstrate that the process achieved greater control with less variation. In the next 5 years the falls rate increased to preprogramme levels and control graphs demonstrated that the process was no longer controlled. Compliance with the programme had deteriorated. Conclusions. The practice review considered skill mix, patient activity and acuity but provided no definitive answers to explain non-compliance. The implications to nursing are discussed. Relevance to clinical practice. Clinicians are called to conduct more rigorous research into falls prevention but it may be more useful to direct research towards examining nursing work and increasing nurse autonomy in falls prevention.

Dempsey, J. (2005). "Commentary on Dempsey J (2004) Falls prevention revisited: a call for a new approach. *Journal of Clinical Nursing* 13, 479-485 - Response." *Journal of Clinical Nursing* 14(1): 129-129.

Dempsey, J. (2009). "Nurses values, attitudes and behaviour related to falls prevention." *Journal of Clinical Nursing* 18(6): 838-848.

To test changes in adherence to nurses' falls prevention work resulting from improving attitudes and ownership of practice. Workforce surveys indicate that nurses leave nursing because they cannot deliver the care they value. When challenged why, nurses claim no power of decision-making or authority to change their work with dissatisfaction and disengagement with work ensuing. Nurses espouse 'caring' but are observed taking risks with patients' safety reflecting poor congruence between values and behaviours. Attitudes and decision-making involvement are factors that influence work behaviours. Hence, increased adherence should be achieved by improving nurses' attitudes through active decision-making surrounding practice. Mixed methods study. Mixed methods were employed during 2004 by surveying attitudes (self-esteem, professional values and work satisfaction) before and after re-engineering nurses' work using practice development (PD) to gain time to spend in prevention work. Practice behaviour was observed and measured at intervals during the study. Initially, nurses had good self-esteem and professional values but were not satisfied with their work. Following the PD, self-esteem and professional values were unaffected; however, nurses expressed increased sense of ownership and greater satisfaction. Nurses were observed to engage in more prevention work. More effective ways of assessing and communicating risk and monitoring nurses' performance of prevention work were created and evaluated. Patients' environments were made safer and more patient-centred. Manipulation of attitudes and values is not warranted if attitudes and values are good. However, participation in work-related decision-making engages practitioners and leads to greater congruence between values and

behaviour. Recommendations include promoting reflection and action to achieve cultural change and person-centred care. This study is relevant to international readership as adds to what is known about nurses' practice behaviours related to falls prevention and will assist others when designing and implementing programs that address patient safety and optimise nurses' adherence.

Diener, D. D. and J. M. Mitchell (2005). "Impact of a multifactorial fall prevention program upon falls of older frail adults attending an adult health day care center." Topics in Geriatric Rehabilitation **21**(3): 247-257.

A 3-month multifactorial fall prevention program was provided to 72 frail older adults attending an adult health day care center. A treatment control group design was used, with data collected at baseline and 6-month follow-up. Treatment consisted of a physical therapy assessment, 3-month exercise program, home hazards assessment, and fall prevention education. At 6 months, the treatment group significantly reduced their falls to 21.7% falling, compared to 46.2% for the control group. Home hazards were also significantly reduced by 50%. At 3 months, the treatment participants improved on 2 of the 4 strength and performance measures, but these gains were lost by the 6-month time period. Authors conclude that a fall prevention program with multiple components is beneficial for very frail older adults.

Dinan, S. (2004). "Exercise for the prevention of falls and injuries: Specialist training for health and exercise professionals working with frailer older people." Journal of Aging and Physical Activity **12**(3): 444-445.

Edelberg, H. K. (2002). "Prevention of falls in the older patient." American Journal of Geriatric Psychiatry **10**(2): 13-13.

Feder, G., C. Cryer, et al. (2000). "Guidelines for the prevention of falls in people over 65." British Medical Journal **321**(7267): 1007-1011.

Filiatrault, J., L. Gauvin, et al. (2008). "Impact of a Multifaceted Community-Based Falls Prevention Program on Balance-Related Psychologic Factors." Archives of Physical Medicine and Rehabilitation **89**(10): 1948-1957.

Objective: To assess the impact of a multifaceted falls prevention program including exercise and educational components on perceived balance and balance confidence among community-dwelling seniors. Design: Quasi-experimental design. Setting: Community-based organizations. Participants: Two hundred community-dwelling adults aged 60 years and over recruited by community-based organizations. Intervention: A 12-week multifaceted falls prevention program including 3 components (a 1-hour group exercise class held twice a week, a 30-minute home exercise module to be performed at least once a week, a 30-minute educational class held once a week). Main Outcome Measures: Perceived balance and balance confidence. Results: Multivariate analysis showed that the program was successful in increasing perceived balance in experimental participants. However, balance confidence was not improved by program participation. Conclusions: A multifaceted community-based falls prevention program that was successful in improving balance performance among community-dwelling seniors also had a positive impact on perceived balance. However, the program did not improve participants' balance confidence. These results suggest that balance confidence has determinants other than balance and that new components and/or modifications of existing components

of the program are required to achieve maximal benefits for seniors in terms of physical and psychologic outcomes.

Filiatrout, J., M. Parisien, et al. (2007). "Implementing a community-based falls-prevention program: From drawing board to reality." Canadian Journal on Aging-Revue Canadienne Du Vieillissement **26**(3): 213-225.

Several studies have demonstrated the efficacy of falls-prevention programs designed for community-dwelling seniors using randomized designs. However, little is known about the feasibility of implementing these programs under natural conditions and about the success of these programs when delivered under such conditions. The objectives of this paper are to (a) describe a multifactorial falls-prevention program (called Stand Up!) designed for independent community-dwelling seniors and (b) present the results of an analysis of the practicability of implementing this program in community-based settings. The program was implemented in the context of an effectiveness study in 10 community-based organizations in the Montreal metropolitan area. Data pertaining to the reach and delivery of the program as well as participation level show that a falls-prevention program addressing multiple risk factors can be successfully implemented in community-based settings.

Friedman, S. M., B. Munoz, et al. (2002). "Falls and fear of falling: Which comes first? A longitudinal prediction model suggests strategies for primary and secondary prevention." Journal of the American Geriatrics Society **50**(8): 1329-1335.

OBJECTIVES: Previous cross-sectional studies have shown a correlation between falls and fear of falling, but it is unclear which comes first. Our objectives were to determine the temporal relationship between falls and fear of falling, and to see whether these two outcomes share predictors. DESIGN: A 20-month, population-based, prospective, observational study. SETTING: Salisbury, Maryland. Each evaluation consisted of a home-administered questionnaire, followed by a 4- to 5-hour clinic evaluation. PARTICIPANTS: The 2,212 participants in the Salisbury Eye Evaluation project who had baseline and 20-month follow-up clinic evaluations. At baseline, subjects were aged 65 to 84 and community dwelling and had a Mini-Mental State Examination score of 18 or higher. MEASUREMENTS: Demographics, visual function, comorbidities, neuropsychiatric status, medication use, and physical performance-based measures were assessed. Stepwise logistic regression analyses were performed to evaluate independent predictors of falls and fear of falling at the follow-up evaluation, first predicting incident outcomes and then predicting fall or fear-of-falling status at 20 months with baseline falling and fear of falling as predictors. RESULTS: Falls at baseline were an independent predictor of developing fear of falling 20 months later (odds ratio (OR) = 1.75;  $P < .0005$ ), and fear of falling at baseline was a predictor of falling at 20 months (OR = 1.79;  $P < .0005$ ). Women with a history of stroke were at risk of falls and fear of falling at follow-up. In addition, Parkinson's disease, comorbidity, and white race predicted falls, whereas General Health Questionnaire score, age, and taking four or more medications predicted fear of falling. CONCLUSION: Individuals who develop one of these outcomes are at risk for developing the other, with a resulting spiraling risk of falls, fear of falling, and functional decline. Because falls and fear of falling share predictors, individuals who are at a high risk of developing these endpoints can be identified.

Fujisawa, M., M. Ishine, et al. (2007). "Effects of long-term exercise class on prevention of falls in community-dwelling elderly: Kahoku longitudinal aging study." Geriatrics & Gerontology International **7**(4): 357-362.

Background: We intended to compare the effect on preventing falls between the subjects participating and not participating in exercise classes over 8 years of follow LIP in all the community-dwelling elderly in Kahoku Town, Kochi Prefecture, Japan. Methods: We compared falling state both in 1993 and 2001 between 119 participants (male : female ratio, 51:68; mean age, 72.5 years) in exercise class during the 8-year period from 1993-2001, and 878 non-participants (M : F ratio, 243:635; mean age, 73.4years). We assessed the long-term effects of participating in exercise classes on preventing falls via multivariate, longitudinal analysis. Results: Only participation in both the 1993-1995 period and 1996-2001 one was a significantly independent contributing factor for prevention of falls even after the adjustment for age, sex, activities of daily living, depression scale and presence/absence of oral drugs (odds ratio, 0.20; P = 0.007). Although it failed to reach significance in this study, recent and continuing exercise was supposed to be effective for prevention of falls. Conclusion: Unlike a short program, long-continuing exercise is effective in preventing falls of community-dwelling elderly for a long time after the adjustment of age, activities of daily living, depression and other confounding variables.

Ganz, D. A., G. E. Alkema, et al. (2007). It takes a village to prevent falls: reconceptualizing fall prevention and management for older adults. Workshop on the Social Determinants of Adult Health and Mortality, Washington, DC.

Systematic evidence reviews support the efficacy of physical activity programs and multifactorial strategies for fall prevention. However, community settings in which fall prevention programs occur often differ substantially from the research settings in which efficacy was first demonstrated. Because of these differences, alternative approaches are needed to judge the adequacy of fall prevention activities occurring as part of standard medical care or community efforts. This paper uses the World Health Organization Innovative Care for Chronic Conditions (ICCC) framework to rethink how fall prevention programs might be implemented routinely in both medical and community settings. Examples of innovative programs and policies that provide fall prevention strategies consistent with the ICCC framework are highlighted, and evidence where available is provided on the effects of these strategies on processes and outcomes of care. Finally, a "no wrong door" approach to fall prevention and management is proposed, in which older adults who are found to be at risk of falls in either a medical or community setting are linked to a standard fall risk evaluation across three domains (physical activity, medical risks, and home safety).

Gardner, M. M., D. M. Buchner, et al. (2001). "Practical implementation of an exercise-based falls prevention programme." Age and Ageing **30**(1): 77-83.

Muscle weakness and impaired balance are risk factors underlying many falls and fall injuries experienced by older people. Fall prevention strategies have included exercise programmes that lower the risk of falling by improving strength and balance. We have developed an individually tailored, home-based, strength and balance retraining programme, which has proven successful in reducing falls and moderate fall injuries in people aged 80 years and older. Here we describe a simple assessment of strength and balance and the content and delivery of a falls prevention exercise programme.

Gardner, M. M., M. C. Robertson, et al. (2002). "Application of a falls prevention program for older people to primary health care practice." Preventive Medicine **34**(5): 546-553.

Background. Our research group has established the effectiveness of an individually tailored home exercise program to prevent falls and fall injuries in older people in four controlled trials. In one of these trials we evaluated the applicability of the exercise program to routine primary health care practice and the feasibility of nurses implementing the program. Methods. People aged 80 years and older, registered with general practices in three exercise (n = 330 participants) and four control centers (n = 120 participants) in New Zealand, were invited to take part by their doctor. We investigated program reach, uptake, and compliance. We carried out physical assessments at baseline and after 1 year to assess the impact of the program. Results. Most (85%) doctors agreed to take part and they approved 71% of patients to undertake the exercise program. Overall 47%, of people invited agreed to participate and 70% of the exercise participants remained exercising at 1 year. Balance score and chair stand time improved by a similar amount in each exercise center compared with the control centers. Conclusions. This falls prevention program is acceptable to older people and their doctors. Nurses trained by a physiotherapist can deliver the home exercise program effectively in routine primary health care practice. (C) 2002 American Health Foundation and Elsevier Science (USA).

Gomes, T. and K. M. Chandra (2008). "Prevention of falls and fall-related injuries in the community-dwelling elderly: A review." Value in Health **11**(3): A245-A245.

Greenberg, S. A. (1999). "Falls in older persons: Prevention and management." Nursing and Health Care Perspectives **20**(1): 32-33.

Grenier-Sennelier, C., I. Lombard, et al. (2002). "Designing adverse event prevention programs using quality management methods: the case of falls in hospital." International Journal for Quality in Health Care **14**(5): 419-426.

Objective. From a public health perspective, the effectiveness of any prevention program depends on integrated medical and managerial strategies. In this way, quality management methods drawn from organization and business management can help design prevention programs. The aim of this study was to analyze the potential value of these methods in the specific context of preventing falls in hospital. Setting. Medical and Rehabilitation Care Unit of Saint-Maurice National Hospital (France). Design. In phase 1, two surveys assessed the context in which falls occurred. The first survey (1995) quantified adverse events during a 1-year period (n = 564) and the second (1996-1997) documented the reasons for falls (n = 53). In phase 2, a set of recommendations to prevent falls was elaborated and implemented throughout the hospital. Results. The fall frequency in this unit was 18.3% in 1995. Analysis showed organizational causes in 35 (66%) of the 53 documented falls; 24 of them were associated with individual factors. Even though the two categories of causes are interdependent, their distinction enables specific recommendations. The proposed organizational management changes recommended do not aim to achieve an illusory objective of 'zero falls', but are designed to reduce the number of avoidable falls and to limit the negative consequences of unavoidable falls. Conclusion. Quality improvement methods shed new light on how to prevent falls. An unexploited potential for prevention lies in organization and management of care for hospitalized patients.

Haines, T. P., K. L. Bennell, et al. (2006). "A new instrument for targeting falls prevention interventions was accurate and clinically applicable in a hospital setting." Journal of Clinical Epidemiology **59**(2): 168-175.

Background and Objective: To describe the diagnostic accuracy and practical application of the Peter James Centre Falls Risk Assessment Tool (PJC-FRAT), a multidisciplinary falls risk screening and intervention deployment instrument. Methods: In phase 1, the accuracy of the PJC-FRAT was prospectively compared to a gold standard (the STRATIFY) on a cohort of subacute hospital patients (n = 122). In phase 2, the PJC-FRAT was temporally reassessed using a subsequent cohort (n = 316), with results compared to those of phase 1. Primary outcomes were falls (events), fallers (patients who fell), and hospital completion rates of the PJC-FRAT. Results: In phase 1, PJC-FRAT accuracy of identifying fallers showed sensitivity of 73% (bootstrap 95% confidence interval CI = 55, 90) and specificity of 75% (95% CI = 66, 83), compared with the STRATIFY (cutoff  $\geq 2/5$ ) sensitivity of 77% (95% CI = 59, 92) and specificity of 51% (95% CI = 41, 61). This difference was not significant. In phase 2, accuracy of nursing staff using the PJC-FRAT was lower. PJC-FRAT completion rates varied among disciplines over both phases: nurses and physiotherapists,  $\geq 90\%$ ; occupational therapists,  $\geq 82\%$ ; and medical officers,  $\geq 57\%$ . Conclusion: The PJC-FRAT was practical and relatively accurate as a predictor of falls and a deployment instrument for falls prevention interventions, although continued staff education may be necessary to maintain its accuracy. (c) 2006 Elsevier Inc. All rights reserved.

Hauer, K., B. Rost, et al. (1999). Exercise training for rehabilitation and secondary prevention of falls in geriatric patients with a history of injurious falls. IVth European Congress of Gerontology, Berlin, Germany.

OBJECTIVE: To determine the safety and efficacy of an exercise protocol designed to improve strength, mobility, and balance and to reduce subsequent falls in geriatric patients with a history of injurious falls. DESIGN: A randomized controlled 3-month intervention trial, with an additional 3-month follow-up. SETTING: Out-patient geriatric rehabilitation unit. PARTICIPANTS: Fifty-seven female geriatric patients (mean age 82 +/- 4.8 years; range 75-90) admitted to acute care or inpatient rehabilitation with a history of recurrent or injurious falls including patients with acute fall-related fracture. INTERVENTION: Ambulatory training of strength, functional performance, and balance 3 times per week for 3 months. Patients of the control group attended a placebo group 3 times a week for 3 months. Both groups received an identical physiotherapeutic treatment 2 times a week, in which strengthening and balance training were excluded. MEASUREMENTS: Strength, functional ability, motor function, psychological parameters, and fall rates were assessed by standardized protocols at the beginning (T1) and the end (T2) of intervention. Patients were followed up for 3 months after the intervention (T3). RESULTS: No training-related medical problems occurred in the study group. Forty-five patients (79%) completed all assessments after the intervention and follow-up period. Adherence was excellent in both groups (intervention 85.4 +/- 27.8% vs control 84.2 +/- 29.3%). The patients in the intervention group increased strength, functional motor performance, and balance significantly. Fall-related behavioral and emotional restrictions were reduced significantly. Improvements persisted during the 3-month follow-up with only moderate losses. For patients of the control group, no change in strength, functional performance, or emotional

status could be documented during intervention and follow-up. Fall incidence was reduced nonsignificantly by 25% in the intervention group compared with the control group (RR:0.753 CI:0.455-1.245). CONCLUSIONS: Progressive resistance training and progressive functional training are safe and effective methods of increasing strength and functional performance and reducing fall-related behavioral and emotional restrictions during ambulant rehabilitation in frail, high-risk geriatric patients with a history of injurious falls.

Hill, K., K. Black, et al. (2005). "Commentary on Dempsey J (2004) Falls prevention revisited: a call for a new approach. *Journal of Clinical Nursing* 13, 479-485." *Journal of Clinical Nursing* **14**(1): 126-128.

Hill, K. D. and A. T. Stinson (2001). A pilot study of falls, fear of falling, activity levels and fall prevention actions in older people with polio. Conference of the Australian-Association-of-Gerontology, Canberra, AUSTRALIA.

Background and aims: Polio survivors are ageing, and reporting new complications including falls. The aims of this study were: 1) to determine the frequency of falls, circumstances surrounding them, and the consequences of falls in older people who have polio; and 2) to investigate the range of fall prevention interventions undertaken to reduce the individual's risk of falling. Methods: A survey was conducted of members of the Eastern Polio Support Group of Victoria. Twenty-eight respondents (70%; 7 male, 21 female) had a mean age of 66 years and an average duration of 57 years since the onset of polio. The survey addressed demographic data, mobility, frequency and description of falls over the last 12 months, their consequences, and community services utilized. The Modified Falls Efficacy Scale (MFES) and Human Activity Profile (HAP) were also completed. Comparative data on the MFES and HAP were obtained from age- and gender-matched healthy community-dwelling older people. Results: Fourteen respondents (50%) reported one or more falls over the post 12 months, half reporting multiple falls. Two-thirds of falls occurred while walking. Of those who fell, 67% did not require medical attention. The highest percentage of injuries were bruises or grazes (44%), with one fracture reported. Sixty-one percent reported being fearful of falling, with an average MFES of 7.4 (+/-2.0), compared with the average of 9.7 (+/-0.5) for the age- and gender-matched controls ( $p < 0.05$ ). Only 5 of the respondents reported changing their level of activity as the result of a fall. A significant difference was identified on the Adjusted Activity Score (AAS) of the HAP between polio non-fallers (mean 56.3 +/- 19.1), polio fallers (mean 40.1 +/- 15.6) and age- and gender-matched controls (mean 73.5 +/- 10.3) ( $F_{2,46} = 25.5, p = 0.000$ ). The median number of fall prevention activities undertaken in the previous 12 months was one, 11 of the 28 respondents undertaking two or more. The most common interventions implemented were vision checks (42%) and review of medications by a doctor (25%). Conclusions: A high rate of falling, fear of falling and low activity levels exist in older people with polio. There is a need for further research and clinical programs to reduce falls and injuries in this group. ((C))2004, Editrice Kurtis.

Horton, K. and S. Arber (2004). "Gender and the negotiation between older people and their carers in the prevention of falls." *Ageing and Society* **24**: 75-94.

Little is known about how negotiation between older people and their carers varies according to gender. This paper reports a study of older men and women who have had multiple falls and the actions of their key family members to prevent recurrent

falls. In-depth interviews were conducted with 35 older people who had had recurrent falls, and separately with the identified key family member. The actions taken by the relatives to prevent future falls were classified as protective, coercive, negotiating, engaging and 'reflective of mutual respect'. It was found that sons caring for older mothers took only 'protective' and 'coercive' actions, resulting in mothers having passive and submissive roles. In contrast, the daughters who were caring for their fathers undertook most often 'engaging' and some 'negotiating' actions, which empowered the fathers in their decision making. Daughters had a 'peer-like' relationship with the mothers that they supported and cared for, and undertook primarily 'negotiating' as well as 'engaging' actions. The two men who cared for older men took no specific actions but maintained mutual respect for each other. The findings demonstrate several ways in which the gender of the dyad members influences the nature of the negotiation between close relatives, and throws light on the factors that influence the autonomy and dependence of older people.

Huang, T. T. and G. J. Acton (2004). "Effectiveness of home visit falls prevention strategy for Taiwanese community-dwelling elders: Randomized trial." Public Health Nursing **21**(3): 247-256.

The purpose of this research was to examine the effect of a multifactorial intervention to prevent falls by increasing self-efficacy to prevent falls, improving the knowledge of medication safety, and decreasing the number of environmental risks in older persons dwelling in the community. A sample of 120 cognitively intact residents of this community who were 65 years of age and older were recruited into a two-group pretest-post-test experimental design and randomly assigned to an experimental group and a comparison group (60 in each group). The intervention was delivered, and data were collected during three home visits in a 4-month period. (1) Experimental subjects improved their fall self-efficacy, environmental safety, and knowledge of medication safety significantly ( $p < 0.01$ ) as compared with those in the comparison group at post-test; (2) the incidence of falls was reduced at post-test in both groups compared to pretest scores, and the falling was more serious in the comparison group at post-test compared to that in the experimental group. The results can help community health professionals to individualize their interventions to the specific needs of the elderly, thus helping to prevent falls among community-dwelling elders.

Inokuchi, S., N. Matsusaka, et al. (2007). "Feasibility and effectiveness of a nurse-led community exercise programme for prevention of falls among frail elderly people: A multi-centre controlled trial." Journal of Rehabilitation Medicine **39**(6): 479-485.

Objective: To determine whether an exercise programme provided by public health nurses is effective in improving physical function and psychological status in elderly people, in reducing falls and risk factors for falls in elderly people, and whether the intervention is a feasible programme within the community. Design: Controlled intervention trial. Subjects: Participants included 144 persons in the intervention group and 124 persons in the control group, who were living at home, aged over 65 years, and with 5 or more risk factors for falls identified using the questionnaire for fall assessment (Suzuki). Methods: For participants in the intervention group, an exercise programme was provided by public health nurses. This comprised a weekly exercise class of 2 hours for 17 weeks, supplemented by daily home exercises. Number of risk factors, physical function and psychological status were compared

between the intervention and control groups before and after intervention. The number of further falls during the intervention was also compared between the 2 groups. Results: The programme significantly improved physical function and emotional status, and reduced the number of falls and risk factors for falls. The excellent adherence rate represented broad acceptance of the intervention. Conclusion: The intervention programme was effective and feasible to operate in the community.

Kannus, P., H. Sievanen, et al. (2005). "Prevention of falls and consequent injuries in elderly people." Lancet **366**(9500): 1885-1893.

Injuries resulting from falls in elderly people are a major public-health concern, representing one of the main causes of longstanding pain, functional impairment, disability, and death in this population. The problem is going to worsen, since the rates of such injuries seem to be rising in many areas, as is the number of elderly people in both the developed and developing world. Many methods and programmes to prevent such injuries already exist, including regular exercise, vitamin D and calcium supplementation, withdrawal of psychotropic medication, cataract surgery, professional environment hazard assessment and modification, hip protectors, and multifactorial preventive programmes for simultaneous assessment and reduction of many of the predisposing and situational risk factors. To receive broader-scale effectiveness, these programmes will need systematic implementation. Care must be taken, however, to rigorously select the right actions for those people most likely to benefit, such as vitamin D and calcium supplementation and hip protectors for elderly people living in institutions.

Kempton, A., E. Van Beurden, et al. (2000). "Older people can stay on their feet: final results of a community-based falls prevention programme." Health Promotion International **15**(1): 27-33.

Objective: To evaluate a multi-strategic community-based intervention to prevent older people falling. Design: A prospective cohort study comparing randomly selected samples from intervention and control area target populations (residents of 60 years). Repeat, cross-sectional (annual) reviews of fall-related hospitalizations were also conducted providing an independent measure of falls incidence in the target populations. Setting: North Coast of New South Wales, Australia (a large, rural region). Subjects: Cohort study (1991-1995): randomly selected subjects aged 60 years and over, enrolled via telephone interview into intervention and control area cohorts. Cross-sectional study (1991/992-1994/1995): all residents aged 60 years and over, from intervention and control areas hospitalized with fall-related injuries. Intervention: A 1-year (1992-1995) multi-strategic intervention targeting fall-related knowledge, attitudes, behaviours and risk factors. Main outcome measures: Self-reported falls and fall-related hospitalization incidence rates. Fall-related knowledge, attitudes, behaviours and risk factor prevalence rates. Results: At follow-up there was a 22% non-significant lower incidence of self-reported falls in the intervention compared to the control cohort ( $p = 0.17$ ). This was supported by a 20% lower fall-related hospitalization rate in target group residents from intervention compared to control areas ( $p < 0.01$ ). Increased falls knowledge, physical activity and safe footwear were also observed in the intervention cohort together with improved balance and reduced intake of fall-related medications. Conclusions: Promotion of appropriate behaviours, environments and policies can improve fall-related outcomes given a commitment to involvement of older people and

sufficient lead time.

Kim, B. J. (2009). "Prevention of falls during stairway descent in older adults." Applied Ergonomics **40**(3): 348-352.

A prospective design was applied to examine how older adults would adapt stairway intervention stimuli to gait patterns during stairway descent to prevent falls. Ambient lighting and an auditory signal were used as stairway intervention stimuli. The gait pattern changes with and without stimuli were compared. No significant change of angular displacement was found between normal condition and intervention conditions under daylight and nightlight. The lighting intervention tended to increase the knee's angular velocity for both daylight and nightlight conditions, but not the ankle's angular velocity. However, adding the auditory signal to the lighting intervention under nightlight condition increased the ankle's angular velocity. Under the daylight condition, every intervention was significantly helpful to make people step on the floor more confidently compared to the condition without interventions. However, the intervention of lighting had an opposite effect on the confidence of stepping under the nightlight condition. The intervention of lighting may contribute to increase of confidence during stair descent while compromising the declined stride length in older adults and the potential "rush" factor for falls on stairs. (c) 2008 Elsevier Ltd. All rights reserved.

Kinirons, M. T. and F. Martin (2003). "Randomised controlled trial of a nurse-led falls prevention programme." Age and Ageing **32**(3): 361-U5.

Laforest, S., A. Pelletier, et al. (2009). "Impact of a Community-Based Falls Prevention Program on Maintenance of Physical Activity Among Older Adults." Journal of Aging and Health **21**(3): 480-500.

Objective: This study examines the 9-month impact of a 12-week falls prevention program (called Stand Up!) which included balance exercises and educational components on maintenance of physical activity among community-dwelling seniors. Method: Data were collected among 98 experimental and 102 control participants at baseline, immediately after the program and 9 months later. Involvement in physical activity was measured with three indicators. Program effects were examined using linear and logistic regression procedures. Results: Both groups showed similar increases in weekly frequency of exercise at the 9-month posttest. However, the program's participants showed higher increases in their variety of exercises at the 9-month posttest (especially among those with greater baseline scores). Among seniors reporting lower levels of energy expenditure at baseline, the program's participants showed significantly greater increases in energy expenditure than control participants. Discussion: These preliminary findings suggest that programs such as Stand Up! have the potential to stimulate continued involvement in physical activity.

Lamb, S. E., J. D. Fisher, et al. (2008). "A national survey of services for the prevention and management of falls in the UK." Bmc Health Services Research **8**.

Background: The National Health Service (NHS) was tasked in 2001 with developing service provision to prevent falls in older people. We carried out a national survey to provide a description of health and social care funded UK fallers services, and to benchmark progress against current practice guidelines. Methods: Cascade approach to sampling, followed by telephone survey with senior member of the fall service.

Characteristics of the service were assessed using an internationally agreed taxonomy. Reported service provision was compared against benchmarks set by the National Institute for Health and Clinical Excellence (NICE). Results: We identified 303 clinics across the UK. 231 (76%) were willing to participate. The majority of services were based in acute or community hospitals, with only a few in primary care or emergency departments. Access to services was, in the majority of cases, by health professional referral. Most services undertook a multi-factorial assessment. The content and quality of these assessments varied substantially. Services varied extensively in the way that interventions were delivered, and particular concern is raised about interventions for vision, home hazard modification, medication review and bone health. Conclusion: The most common type of service provision was a multi-factorial assessment and intervention. There were a wide range of service models, but for a substantial number of services, delivery appears to fall below recommended NICE guidance.

Lamb, S. E., E. C. Jorstad-Stein, et al. (2005). "Development of a common outcome data set for fall injury prevention trials: The prevention of falls network Europe consensus." Journal of the American Geriatrics Society **53**(9): 1618-1622.

The prevention of injury associated with falls in older people is a public health target in many countries around the world. Although there is good evidence that interventions such as multifactorial fall prevention and individually prescribed exercise are effective in reducing falls, the effect on serious injury rates is unclear. 1,2 Historically, trials have not been adequately powered to detect injury endpoints, and variations in case definition across trials have hindered meta-analysis.(1) It is possible that fall-prevention strategies have limited effect on falls that result in injuries or are ineffective in populations who are at a higher risk of injury. Further research is required to determine whether fall-prevention interventions can reduce serious injuries. Prevention of Falls Network Europe (ProFaNE) is a collaborative project to reduce the burden of fall injury in older people through excellence in research and promotion of best practice ([www.profane.eu.org](http://www.profane.eu.org)). The European Commission funds the network, which links clinicians, members of the public, and researchers worldwide. The aims are to identify major gaps in knowledge in fall injury prevention and to facilitate the collaboration necessary for large-scale clinical research activity, including clinical trials, comparative research, and prospective meta-analysis. Work is being undertaken in a 4-year program. As a first step, the development of a common set of outcome definitions and measures for future trials or meta-analysis was considered.

Larsen, E. R., L. Mosekilde, et al. (2001). "Determinants of acceptance of a community-based program for the prevention of falls and fractures among the elderly." Preventive Medicine **33**(2): 115-119.

Background. Low-energy fractures among the elderly may be prevented by measures aimed at reducing the risk of falling or increasing the strength of the skeleton. Acceptance of these interventions in the target population is necessary for their success. Methods. The total elderly population in a Danish municipality 7,543 community-dwelling persons aged 66+ years, were offered participation in one of three intervention programs: 2,550 persons were offered a home safety inspection, evaluation of prescribed medicine, and identification of possible health and food problems (Program I); 2,445 persons were offered 1000 mg of elemental calcium and 400 IU (10 mug) of vitamin D-3 per day in combination with evaluation of

prescribed medicine (Program II); and 2,548 persons were offered a combination of the two programs (Program III). Acceptance was defined as willingness to receive an introductory visit by a nurse. Results. Acceptance of Program I was 50%; of Program II, 56% ( $P < 0.00005$  as contrasted with Program I); and of Program III, 46% ( $P < 0.005$ ). Acceptance was associated with gender (females, 53%; males, 47%) and did not change from ages 66 to 84 but decreased significantly after the age of 85. Widows aged 66-84 had the highest acceptance (57%) and never married males aged 66-84 the lowest (30%). An important determinant, however, was the individual social service center that communicated the specific program. Acceptance varied from 39 to 66% between the social centers. Conclusions. Acceptance of a fall and fracture prevention program varies with intervention type; with gender, age, and social status of the target population; and with the motivation and attitude of the health workers involved in the implementation of the program. 2001 American Health Foundation and Academic Press.

Li, F. Z., P. Harmer, et al. (2008). "Translation of an effective tai chi intervention into a community-based falls-prevention program." American Journal of Public Health **98**(7): 1195-1198.

Tai Chi-Moving for Better Balance, a falls-prevention program developed from a randomized controlled trial for community-based use, was evaluated with the RE-AIM framework in 6 community centers. The program had a 100% adoption rate and 87% reach into the target older adult population. All centers implemented the intervention with good fidelity, and participants showed significant improvements in health-related outcome measures. This evidence-based tai chi program is practical to disseminate and can be effectively implemented and maintained in community settings.

Liaw, S. T., N. Sulaiman, et al. (2003). "Falls prevention within the Australian general practice data model: Methodology, information model, and terminology issues." Journal of the American Medical Informatics Association **10**(5): 425-432.

The iterative development of the Falls Risk Assessment and Management System (FRAMS) drew upon research evidence and early consumer and clinician input through focus groups, interviews, direct observations, and an online questionnaire. Clinical vignettes were used to validate the clinical model and program logic, input, and output. The information model was developed within the Australian General Practice Data Model (GPDM) framework. The online FRAMS implementation used available Internet (TCP/IP), messaging (HL7, XML), knowledge representation (Arden Syntax), and classification (ICD10-AM, ICPC2) standards. Although it could accommodate most of the falls prevention information elements, the GPDM required extension for prevention and prescribing risk management. Existing classifications could not classify all falls prevention concepts. The lack of explicit rules for terminology and data definitions allowed multiple concept representations across the terminology-architecture interface. Patients were more enthusiastic than clinicians. A usable standards-based online-distributed decision support system for falls prevention can be implemented within the GPDM, but a comprehensive terminology is required. The conceptual interface between terminology and architecture requires standardization, preferably within a reference information model. Developments in electronic decision support must be guided by evidence-based clinical and information models and knowledge ontologies. The safety and quality of knowledge-based decision support systems must be monitored. Further examination

of falls and other clinical domains within the GPDM is needed.

Lightbody, E., C. Watkins, et al. (2002). "Evaluation of a nurse-led falls prevention programme versus usual care: a randomized controlled trial." Age and Ageing **31**(3): 203-210.

Objective: to evaluate a nurse-led management plan and care pathway for older people discharged from an Accident and Emergency Department after a fall. Design: randomized controlled trial. Setting: a large teaching hospital. Subjects: 348 consecutive patients aged 65 or over attending the Accident and Emergency Department with a fall. Interventions: we randomized patients to falls nurse intervention or usual care. Within 4 weeks, the intervention group received a home assessment to address easily modifiable risk factors for falls. This included assessments of medication, ECG, blood pressure, cognition, visual acuity, hearing, vestibular dysfunction, balance, mobility, feet and footwear. All patients were given advice and education about general safety in the home. Main outcome measures: Further falls, functional ability, re-attendance at the Accident and Emergency Department and admission to hospital. Results: at 6 months post-Index fall, 36 patients in the intervention group and 39 patients in the control group had had 89 and 145 falls respectively. Although the intervention group had less falls, this was not significant ( $P>0.05$ ). Similarly, the intervention group had fewer fall-related admissions and bed days (8 and 69 respectively) than the control group (10 and 233 respectively). The intervention group scored significantly higher in indicators of function ( $P<0.05$ ) and mobility within the community ( $P<0.02$ ). Conclusions: although the differences were not significant, patients in the intervention group had fewer falls, less hospital attendances and spent less time in hospital. Moreover, patients in the intervention group were more functionally independent at 6 months post-Index fall.

Liu-Ambrose, T., M. Y. C. Pang, et al. (2007). "Executive function is independently associated with performances of balance and mobility in community-dwelling older adults after mild stroke: Implications for falls prevention." Cerebrovascular Diseases **23**(2-3): 203-210.

Background: Stroke survivors have a high incidence of falls. Impaired executive-controlled processes are frequent in stroke survivors and are associated with falls in this population. Better understanding of the independent association between executive-controlled processes and physiological fall risk (i.e. performances of balance and mobility) could enhance future interventions that aim to prevent falls and to promote an independent lifestyle among stroke survivors. Methods: Cross-sectional analysis of 63 adults who suffered a mild stroke 1 1 year prior to the study, aged 6 50 years. Results: Cognitive flexibility was independently associated with performances of balance and mobility in community-dwelling older adults after mild stroke, after accounting for age, quadriceps strength of the paretic side and current physical activity level. Conclusions: Clinicians may need to consider cognitive function when assessing and treating impaired balance and mobility in community-dwelling older adults after mild stroke. Copyright (c) 2007 S. Karger AG, Basel.

Lord, S. R., A. Tiedemann, et al. (2005). "The effect of an individualized fall prevention program on fall risk and falls in older people: A randomized, controlled trial." Journal of the American Geriatrics Society **53**(8): 1296-1304.

OBJECTIVES: To determine whether an individualized falls prevention program

comprising exercise, visual, and counseling interventions can reduce physiological falls risk and falls in older people. DESIGN: Randomized, controlled trial of 12 months' duration. SETTING: Falls Clinic, Royal North Shore Hospital, Sydney, Australia. PARTICIPANTS: Six hundred twenty people aged 75 and older recruited from a health insurance company membership database. INTERVENTIONS: Participants in the extensive intervention group (EIG) received individualized interventions comprising exercise and strategies for maximizing vision and sensation; the minimal intervention group (MIG) received brief advice; and the control group (CG) received no intervention. MEASUREMENTS: Accidental falls, vision, postural sway, coordinated stability, reaction time, lower limb muscle strength, sit-to-stand performance, and physiological profile assessment (PPA) falls risk scores. RESULTS: At the 6-month follow-up, PPA falls risk scores were significantly lower in the EIG than in the CG. EIG subjects assigned to the extensive exercise intervention group showed significant improvements in tests of knee flexion strength and sit-to-stand times but no improvements in balance. EIG subjects assigned to the extensive visual intervention group showed significant improvements in tests of visual acuity and contrast sensitivity. The rate of falls and injurious falls within the trial period were similar in the three groups. CONCLUSION: The individualized intervention program reduced some falls risk factors but did not prevent falls. The lack of an effect on falls may reflect insufficient targeting of the intervention to an at-risk group.

Lundebjerg, N., L. Z. Rubenstein, et al. (2001). "Guideline for the prevention of falls in older persons." Journal of the American Geriatrics Society **49**(5): 664-672.

Mackintosh, S. F. H., K. Hill, et al. (2005). "Falls and injury prevention should be part of every stroke rehabilitation plan." Clinical Rehabilitation **19**(4): 441-451.

Objective: To evaluate falls incidence, circumstances and consequences in people who return home after stroke rehabilitation, so that appropriate falls and injury prevention strategies can be developed. Design: Prospective cohort study. Setting: Community. Subjects: Fifty-six subjects with stroke who were participating in a rehabilitation programme and returning to live in a community setting completed the study. Main measures: Subjects completed a prospective falls diary for six months after discharge from rehabilitation, and were interviewed after falls. Physical function was measured by the Berg Balance Scale (BBS) and the Functional Independence Measure (FIM). Results: Forty-six per cent of people (26/56) fell, with most falls (63/103 falls) occurring in the two months after discharge from rehabilitation. One subject had 37 similar falls and these falls were excluded from further analysis. Falls occurred more often indoors (50/66), during the day (46/66) and towards the paretic side (25/66). People required assistance to get up after 25 falls (38%) and 36 falls (55%) resulted in an injury. People sought professional health care after only 16 falls, and activity was restricted after 29 falls (44%). The Berg Balance Scale and Functional Independence Measure scores were lower in people who had longer lies after a fall, and who restricted their activity after a fall ( $p < 0.05$ ). Lower physical function scores were also associated with falling in the morning, wearing multifocal glasses at the time of a fall, and injurious falls ( $p < 0.05$ ). Conclusion: Falls are common when people return home after stroke. Of concern are the small number seeking health professionals' assistance after a fall, the high proportion restricting their activity as a result of a fall and the number of falls occurring towards the paretic side.

Mahoney, J., T. Shea, et al. (2005). "A randomized trial of a multifactorial community-based falls prevention model." Gerontologist **45**: 383-383.

Mahoney, J. E., T. A. Shea, et al. (2005). Kenosha County falls prevention study: A randomized, controlled trial of an intermediate-intensity, community-based multifactorial falls intervention. 58th Annual Meeting of the Gerontological-Society-of-America, Orlando, FL.

OBJECTIVES: To decrease the rate of falls in high-risk community-dwelling older adults. DESIGN: Randomized, controlled trial. SETTING: Community-based. PARTICIPANTS: Three hundred forty-nine adults aged 65 and older with two falls in the previous year or one fall in the previous 2 years with injury or balance problems. INTERVENTION: Subjects received two in-home visits from a trained nurse or physical therapist who assessed falls risk factors using an algorithm. The intervention consisted of recommendations to the subject and their primary physician, referrals to physical therapy and other providers, 11 monthly telephone calls, and a balance exercise plan. Control subjects received a home safety assessment. MEASUREMENTS: The primary outcome was rate of falls per year in the community. Secondary outcomes included all-cause hospitalizations and nursing home admissions per year. RESULTS: There was no difference in rate of falls between the intervention and control groups (rate ratio (RR) = 0.81, P = .27). Nursing home days were fewer in the intervention group (10.3 vs 20.5 days, P = .04). Intervention subjects with a Mini-Mental State Examination (MMSE) score of 27 or less had a lower rate of falls (RR = 0.55; P = .05) and, if they lived with someone, had fewer hospitalizations (RR = 0.44, P = .05), nursing home admissions (RR = 0.15, P = .003), and nursing home days (7.5 vs 58.2, P = .008). CONCLUSION: This multifactorial intervention did not decrease falls in at-risk community-living adults but did decrease nursing home utilization. There was evidence of efficacy in the subgroup who had an MMSE score of 27 or less and lived with a caregiver, but validation is required.

Mahoney, J. E., E. West, et al. (2006). Recruiting older adults for falls prevention research. Annual Meeting of the American-Geriatrics-Society, Chicago, IL.

Marks, R. (2004). "Falls-prevention programs for older ambulatory community dwellers: from public health research to health promotion policy." Sozial-Und Praventivmedizin **49**(3): 171-178.

Objectives: Falls result in significant morbidity and mortality among the elderly. The purpose was to review the public health research literature on falls prevention among community-dwelling older adults and derive evidence-based implications for health promotion policy. Methods: CINAHL, COCHRANE, EMBASE, MEDLINE, and PUBMED databases were used to search the research literature concerning falls epidemiology, injury mechanisms, and falls-prevention strategies published during 1966-2003. Results: Falls affect one in three older adults living in the community and result in significant fall-related injuries that constitute an important and costly public health problem. There are numerous, but potentially modifiable, determinants of falls. Several community falls-prevention programs have been shown to reduce the incidence of falls and fall-related injuries. Conclusions: The review suggests that there is compelling evidence from public health research to support health promotion policy for making societal investments in community falls-prevention programs.

Marshall, S., K. McCulloch, et al. (2005). Combined dual-task and balance training for prevention of falls in older adults. Annual Scientific Meeting of the American-Geriatrics-Society, Orlando, FL.

Martorello, L. and E. Swanson (2006). "Effectiveness of an automatic manual wheelchair braking system in the prevention of falls." Assistive Technology **18**(2): 166-169.

The purpose of this study was to evaluate the effectiveness of an automatic manual wheelchair braking system in the reduction of falls for patients at high risk of falls while transferring to and from a manual wheelchair. The study design was a normative survey carried out through the use of a written questionnaire sent to 60 skilled nursing facilities to collect data from the medical charts, which identified patients at high risk for falls who used an automatic wheelchair braking system. The facilities participating in the study identified a frequency of falls of high-risk patients while transferring to and from the wheelchair ranging from 2 to 10 per year, with a median fall rate per facility of 4 falls. One year after the installation of the automatic wheelchair braking system, participating facilities demonstrated a reduction of zero to three falls during transfers by high-risk patients, with a median fall rate of zero falls. This represents a statistically significant reduction of 78% in the fall rate of high-risk patients while transferring to and from the wheelchair,  $t(18) = 6.39$ ,  $p < .0001$ . Incident reports of falls to and from manual wheelchairs were reviewed retrospectively for a 1-year period. This study suggests that high-risk fallers transferring to or from manual wheelchairs sustained significantly fewer falls when the Steddy Mate automatic braking system for manual wheelchairs was installed. The application of the automatic braking system allows clients, families/caregivers, and facility personnel an increased safety factor for the reduction of falls from the wheelchair.

McInnes, L., E. Gibbons, et al. (2005). "Clinical practice guideline for the assessment and prevention of falls in older people." Worldviews on Evidence-Based Nursing **2**(1): 33-36.

McNicoll, L. and L. Baumhover (2006). Improving patient safety outcomes using a delirium prevention program; Reducing injurious falls, pressure ulcers, and sitter use. Annual Meeting of the American-Geriatrics-Society, Chicago, IL.

Menz, H. B. and K. D. Hill (2007). "Podiatric involvement in multidisciplinary falls-prevention clinics in Australia." Journal of the American Podiatric Medical Association **97**(5): 377-384.

Background: Falls in older people are a major public health problem, and there is increasing evidence that foot problems and inappropriate footwear increase the risk of falls. Several multidisciplinary prevention clinics have been established to address the problem of falls; however, the role of podiatry in these clinics has not been clearly defined. The aims of this study were to determine the level of podiatric involvement in multidisciplinary falls clinics in Australia and to describe the assessments undertaken and interventions provided by podiatrists in these settings. Methods: A database of falls clinics was developed through consultation with departments of health in each state and territory. Clinic managers were contacted and surveyed as to whether the clinic incorporated podiatry services. If so, the podiatrists were contacted and asked to complete a brief questionnaire regarding their level of involvement and the assessment procedures and interventions offered. Results: Of the 36 clinics contacted, 25 completed the survey. Only four of these

clinics reported direct podiatric involvement. Despite the limited involvement of podiatry in these clinics, all of the clinic managers stated that they considered podiatry to have an important role to play in falls prevention. Podiatry service provision in falls clinics varied considerably in relation to eligibility criteria, assessments undertaken, and interventions provided. Conclusions: Despite the recognition that foot problems and inappropriate footwear are risk factors for falls, podiatry currently has a relatively minor and poorly defined role in multidisciplinary falls-prevention clinics in Australia.

Modawal, A., C. Yund, et al. (2005). Hamilton County Falls Task Force: A novel community model for falls and injury prevention in older adults. Annual Scientific Meeting of the American-Geriatrics-Society, Orlando, FL.

Muir, S. W., K. Berg, et al. (2008). Identification and stratification of fall risk in older adults: Validation of the American Geriatrics Society Algorithm for screening in falls prevention. Annual Meeting of the American-Geriatrics-Society, Washington, DC.

Murray, E., L. Rubenstein, et al. (2002). "VA GRECC symposium: Osteoporosis and falls prevention: New developments." Gerontologist **42**: 187-188.

Namazi, K. H., D. Cason, et al. (2002). "A model instruction for teaching prehospital personnel about falls prevention for elderly persons." Journal of the American Geriatrics Society **50**(4): P182.

Neyens, J. C. L., B. P. J. Dijcks, et al. (2009). "A multifactorial intervention for the prevention of falls in psychogeriatric nursing home patients, a randomised controlled trial (RCT)." Age and Ageing **38**(2): 194-199.

Objective: to evaluate the effectiveness of a multifactorial intervention on incidence of falls in psychogeriatric nursing home patients. Design: cluster-randomised controlled 12-month trial. Setting: psychogeriatric wards in 12 nursing homes in The Netherlands. Participants: psychogeriatric nursing home patients (n = 518). Intervention: a general medical assessment and an additional specific fall risk evaluation tool, applied by a multidisciplinary fall prevention team, resulting in general and individual fall prevention activities. Measurements: falls. Results: there were 355 falls in 169.5 patient-years (2.09 falls per patient per year) in the intervention group and 422 falls in 166.3 patient-years (2.54 falls per patient per year) in the control group. Intention-to-treat analysis with adjustment for ward-related and patient-related parameters, and intra-cluster correlation, showed that the intervention group had a significantly lower mean fall incidence rate than the control group (rate ratio = 0.64, 95% CI = 0.43-0.96, P = 0.029). Subgroup analyses showed that fall risk declined further as patients participated longer in the intervention programme. Conclusion: the introduction of a structured multifactorial intervention to prevent falls in psychogeriatric nursing home patients significantly reduces the number of falls. This reduction is substantial and of high clinical relevance.

Panzer, V., J. A. Burleson, et al. (2008). Can a multimedia fall prevention treatment program change behavior and prevent falls? Annual Meeting of the American-Geriatrics-Society, Washington, DC.

Panzer, V., J. A. Burleson, et al. (2009). What Subject, Cognitive or Behavioral components influence falls and fall prevention?: A Structural Equation Model. Annual Meeting of the American-Geriatrics-Society, Chicago, IL.

Peel, N., M. Steinberg, et al. (2000). "Home safety assessment in the prevention of falls among older people." Australian and New Zealand Journal of Public Health **24**(5): 536-539. Objective: Home safety assessment was examined as part of a randomised trial of falls prevention interventions among older community dwellers. Method: Falls prevention strategies, including education and awareness-raising, exercise, home modifications and medical assessment, were trialled with 252 members of the National Seniors Association. Falls outcomes were monitored using a daily calendar diary during intervention and follow-up periods. Results: The home assessment group was significantly more likely to modify their home environment than the controls ( $p < 0.0001$ ). Participants, regardless of group allocation, reported a significant reduction in concern about falling ( $p < 0.0001$ ). During the intervention, the home assessment group had lower incidence rates for falls and injuries than the control group, although differences were not significant. The lowered rates were sustained post-intervention. Conclusions: While the effect on falls incidence of a home safety intervention on its own could not be demonstrated, other benefits, including improved confidence attributable to awareness of such falls prevention measures, were recorded. Implications: The null effects of home modifications on falls prevention in this study may indicate that the program is more appropriate for the frail aged.

Peel, N. M. and J. Warburton (2009). "Using senior volunteers as peer educators: What is the evidence of effectiveness in falls prevention?" Australasian Journal on Ageing **28**(1): 7-11.

Peer education models are well established as a means of delivering health and social welfare information. Common themes identified in regard to peer education are that information sharing and transfer take place; attempts are made to influence knowledge, attitudes or behaviour; that it occurs between people who share similar characteristics or experiences; and that it relies on influential members of a social group or category. Although it is most often associated with younger age-groups, there is growing evidence of involvement of older people as peer educators. As part of community-based fall prevention interventions, there is considerable scope for contribution by peer mentors. This paper explores the theoretical basis for using senior volunteers as peer educators, discusses advantages and disadvantages of this model of service delivery for health promotion of older people and, specifically, reviews the evidence for effectiveness in relation to fall prevention.

Peterson, R. and S. Berns (2006). "Prevention and education to decrease patient falls due to syncope." Journal of Nursing Care Quality **21**(4): 331-334.

This article describes a fall reduction program implemented by the University of Wisconsin Medical Foundation in its 50+ clinic sites and departments located across 5 counties in Southern Wisconsin. The fall reduction program specifically targeted falls due to faints in the clinic setting. To reduce the organization's main reason for patient falls, guidelines were developed and mandatory education was given to staff working in high-risk areas.

Phillips, V. L., D. Y. Roberts, et al. (2008). "Certified nursing aides' and care assistants'

views on falls: Insight for creation and implementation of fall prevention 168 programs." Journal of the American Medical Directors Association **9**(3): 168-172.

**Objectives:** This study examines the views of certified nursing aides (CNAs) and care assistants (CAs) regarding falls to inform fall prevention programs. **Design and Methods:** A qualitative study of 55 CNAs and 22 CAs, comprising 13 focus groups, was conducted with an extensive content analysis of open-ended, falls-related questions. **Results:** Functional status, followed by underlying illness, were the most common fall risk factors mentioned by both CNA and CA groups. All groups discussed reporting falls to a supervisor and examining the patient for injury. Thirty-one percent (4/13) of the groups noted reporting falls to a physician. Fifty-four percent (7/13) mentioned knowledge of documenting falls; no group participated in fall incident reviews. The most common response to a resident fall was to watch at-risk residents more closely if possible given staffing levels. No group felt that they needed more training on falls management and/or prevention. Three groups concluded that falls were not preventable. **Conclusion:** These results suggest that frontline staff likely need education and have yet to be brought into the falls documentation and/or prevention process. Effective interventions need to include frontline staff, while recognizing the constraints of staff shortages and attitudes.

Quigley, P. (2005). "Guest editorial - Research agenda on risk and prevention of falls: 2002-2007." Journal of Rehabilitation Research and Development **42**(1): VII-X.

Rao, S. S. (2005). "Prevention of falls in older patients." American Family Physician **72**(1): 81-88.

Falls are one of the most common geriatric syndromes threatening the independence of older persons. Between 30 and 40 percent of community-dwelling adults older than 65 years fall each year, and the rates are higher for nursing home residents. Falls are associated with increased morbidity, mortality, and nursing home placement. Most falls have multiple causes. Risk factors for falls include muscle weakness, a history of falls, use of four or more prescription medications, use of an assistive device, arthritis, depression, age older than 80 years, and impairments in gait, balance, cognition, vision, and activities of daily living. Physicians caring for older patients should ask about any falls that have occurred in the past year. Assessment should include evaluating the circumstances of the fall and a complete history and physical examination, looking for potential risk factors. The most effective fall prevention strategies are multifactorial interventions targeting identified risk factors, exercises for muscle strengthening combined with balance training, and withdrawal of psychotropic medication. Home hazard assessment and modification by a health professional also is helpful. Copyright (c) 2005 American Academy of Family Physicians.

Rapp, K., S. E. Lamb, et al. (2008). "Prevention of falls in nursing homes: Subgroup analyses of a randomized fall prevention trial." Journal of the American Geriatrics Society **56**(6): 1092-1097.

**OBJECTIVES:** To evaluate the effectiveness of a multifactorial fall prevention program in prespecified subgroups of nursing home residents. **DESIGN:** Secondary analysis of a cluster-randomized, controlled trial. **SETTING:** Six nursing homes in Germany. **PARTICIPANTS:** Seven hundred twenty-five long-stay residents; median age 86; 80% female. **INTERVENTION:** Staff and resident education on fall prevention, advice on environmental adaptations, recommendation to wear hip

protectors, and progressive balance and resistance training. MEASUREMENTS: Time to first fall and the number of falls. Falls were assessed during the 12-month intervention period. Univariate regression analyses were performed, including a confirmatory test of interaction. RESULTS: The intervention was more effective in people with cognitive impairment (hazard ratio (HR)=0.49, 95% confidence interval (CI)=0.35-0.69) than in those who were cognitively intact (HR=0.91, 95% CI=0.68-1.22), in people with a prior history of falls (HR=0.47, 95% CI=0.33-0.67) than in those with no prior fall history (HR=0.77, 95% CI=0.58-1.01), in people with urinary incontinence (HR=0.59, 95% CI=0.45-0.77) than in those with no urinary incontinence (HR=0.98, 95% CI=0.68-1.42), and in people with no mood problems (incidence rate ratio (IRR)=0.41, 95% CI=0.27-0.61) than in those with mood problems (IRR=0.74, 95% CI=0.51-1.09). CONCLUSION: The effectiveness of a multifactorial fall prevention program differed between subgroups of nursing home residents. Cognitive impairment, a history of falls, urinary incontinence, and depressed mood were important in determining response.

Richard, L., L. Gauvin, et al. (2008). "Integrating the ecological approach in health promotion for older adults: a survey of programs aimed at elder abuse prevention, falls prevention, and appropriate medication use." *International Journal of Public Health* **53**(1): 46-56.

This study assesses the extent of integration of the ecological approach in disease prevention and health promotion (DPHP) programs for older adults in a sample of organisations offering such programming in Quebec, Canada. Following from our previous work, the study used a model identifying intervention settings, targets, and strategies as independent dimensions of ecological programming. As a first step, public health units, local community health centres and seniors' day centres were surveyed to identify DPHP programs for older adults. In a second phase, detailed data were obtained about programs in the theme areas of elder abuse prevention, falls prevention, and appropriate medication use. Overall, 132 programs were investigated including 17 public health unit programs, 72 local community health centre programs, and 43 day centre programs. All data were obtained through telephone interviews. The DPHP programs for these organisations tended to be situated in organisational (especially health organisation) and community settings, with individual clients and organisations as main intervention targets. Assessment of the level of integration of the ecological approach showed it to be relatively low, especially in the local community health centres and seniors' day centres.

Rivara, F. P. and D. C. Thompson (2000). "Prevention of falls in the construction industry - Evidence for program effectiveness." *American Journal of Preventive Medicine* **18**(4): 23-26. Objective: The objective of this study was to review the evidence for the effectiveness of different strategies to prevent falls from heights in the construction industry. Search Strategy: We used the Cochrane Collaboration search strategy to search the following electronic databases: MEDLINE, EMBASE, NIOSHTIC, PsycINFO and Dissertation Abstracts. The reference lists from each potentially eligible study were checked, and knowledgeable people in the field were contacted for additional leads to published reports. Selection Criteria: Studies were included if they (1) examined the effectiveness of an intervention to decrease falls from heights to construction workers, (2) included data on one of the outcomes of interest, and (3) included a comparison group. Main Results: We identified only three studies for review. An ecologic study found some evidence that regulations with enforcement

may decrease falls in construction industry. Two studies on educational efforts suggested that educational programs may decrease falls but methodologic limitations restricted the conclusions that could be drawn. Conclusions: There are few data to support the effectiveness of current programs to decrease fall-related injuries in the construction industry. Rigorous evaluation of these interventions is indicated.

Robertson, M. C. and A. J. Campbell (2001). "Falls prevention and the role of home exercise programmes." Journal of the Royal Society for the Promotion of Health **121**(3): 143-143.

Robertson, M. C., A. J. Campbell, et al. (2005). "Statistical analysis of efficacy in falls prevention trials." Journals of Gerontology Series a-Biological Sciences and Medical Sciences **60**(4): 530-534.

Background. Many different and sometimes inappropriate statistical techniques have been used to analyze the results of randomized controlled trials of falls prevention programs for elderly people. This makes comparison of the efficacy of particular interventions difficult. Methods. We used raw data from two randomized controlled trials of a home exercise program to compare the number of falls in the exercise and control groups during the trials. We developed two different survival analysis models (Andersen-Gill and marginal Cox regression) and a negative binomial regression model for each trial. These techniques a) allow for the fact that falls are frequent, recurrent events with a non-normal distribution; b) adjust for the follow-up time of individual participants; and c) allow the addition of covariates. Results. In one trial, the three different statistical techniques gave surprisingly similar results for the efficacy of the intervention but, in a second trial, underlying assumptions were violated for the two Cox regression models. Negative binomial regression models were easier to use. Conclusion. We recommend negative binomial regression models for evaluating the efficacy of falls prevention programs.

Robson, E. and J. Edwards (2003). "Steady As You Ho (SAYGO): A falls-prevention program for seniors living in the community." Canadian Journal on Aging-Revue Canadienne Du Vieillissement **22**(2): 207-216.

This study was an implementation and community trial of a new falls-prevention program for seniors called Steady As You Go (SAYGO). The program, designed in the Capital Health region of Alberta, integrated the knowledge gained from successful falls-prevention research into a brief community intervention. SAYGO included a multifactorial, risk-abatement approach, as well as a cognitive-behavioural and environmental focus. The target population was relatively healthy and mobile, community-dwelling seniors. The randomized community trial was conducted in urban and rural areas in Alberta, with 660 seniors participating. Seniors who completed the program made significant reductions in eight of the nine risk factors addressed in the program. Over a 4-month follow-up period, the proportion of seniors who fell was lower in the treatment group (17%) than in the control group (23%). Among those seniors who had reported a fall in the previous year, a significantly lower proportion of those in the treatment group experienced a fall in the follow-up period (20%) as compared to those in the control group (35%).

Roe, B., F. Howell, et al. (2009). "Older people and falls: health status, quality of life, lifestyle, care networks, prevention and views on service use following a recent fall." Journal of Clinical Nursing **18**(16): 2261-2272.

Aim and objective. This study has investigated older people's experiences of a recent

fall, its impact on their health, lifestyle, quality of life, care networks, prevention and their views on service use. Background. Falls are common in older people and prevalence increases with age. Falls prevention is a major policy and service initiative. Design. An exploratory, qualitative design involving two time points. Method. A convenience sample of 27 older people from two primary care trusts who had a recent fall. Taped semi structured qualitative interviews were conducted and repeated at follow up to detect change over time and repeat falls. Data were collected on their experience of falls, health, activities of living, lifestyle, quality of life, use of services, prevention of falls, informal care and social networks. Content analysis of transcribed interviews identified key themes. Results. The majority of people fell indoors (n = 23), were repeat fallers (n = 22) with more than half alone when they fell (n = 15). For five people it was their first ever fall. Participants in primary care trust 1 had a higher mean age than those in primary care trust 2 and had more injurious falls (n = 12, mean age 87 years vs. n = 15, mean age 81 years). The majority of non-injurious falls went unreported to formal services. Falls can result in a decline in health status, ability to undertake activities of living, lifestyle and quality of life. Conclusions. Local informal care and support networks are as important as formal care for older people at risk of falls or who have fallen. Access to falls prevention programmes and services is limited for people living in more rural communities. Relevance to practice. Falls prevention initiatives and services should work with local communities, agencies and informal carers to ensure equitable access and provision of information, resources and care to meet the needs of older people at risk or who have fallen.

Rubenstein, L. Z. and K. R. Josephson (2002). "Risk factors for falls: A central role in prevention." Generations-Journal of the American Society on Aging **26**(4): 15-21.

Rubenstein, L. Z. and K. R. Josephson (2006). "Falls and their prevention in elderly people: What does the evidence show?" Medical Clinics of North America **90**(5): 807-+.

Falls are a common and complex geriatric syndrome that cause considerable mortality, morbidity, reduced functioning, and premature nursing home admissions. Falls have multiple precipitating causes and predisposing risk factors, which make their diagnosis, treatment, and particularly, prevention, a difficult clinical challenge. Nonetheless, much can be done to reduce the risk for falls and to improve the quality of life for fall-prone individuals. This article provides an overview of the epidemiology of falls, their major causes and risk factors, the types of available fall-prevention interventions, and the evidence on the efficacy of these interventions.

Rubenstein, L. Z., R. A. Kenny, et al. (2002). "Evidence-based guideline for falls prevention: Summary of the bi-national panel." Generations-Journal of the American Society on Aging **26**(4): 38-41.

Rubenstein, L. Z., C. M. Powers, et al. (2001). "Quality indicators for the management and prevention of falls and mobility problems in vulnerable elders." Annals of Internal Medicine **135**(8): 686-693.

Sakamoto, K., T. Nakamura, et al. (2006). "Effects of unipedal standing balance exercise on the prevention of falls and hip fracture among clinically defined high-risk elderly individuals: a randomized controlled trial." Journal of Orthopaedic Science **11**(5): 467-472.

Background. The aim of this study was to assess the effectiveness of the unipedal

standing balance exercise for 1 min to prevent falls and hip fractures in high-risk elderly individuals with a randomized controlled trial. This control study was designed as a 6-month intervention trial. Subjects. Subjects included 553 clinically defined high-risk adults who were living in residences or in the community. They were randomized to an exercise group and a control group. Methods. Randomization to the subjects was performed by a table of random numbers. A unipedal standing balance exercise with open eyes was performed by standing on each leg for 1 min three times per day. As a rule, subjects of the exercise group stood on one leg without holding onto any support, but unstable subjects were permitted to hold onto a bar during the exercise time. Falls and hip fractures were reported by nurses, physical therapists, or facility staff with a survey sheet every month. This survey sheet was required every month for both groups. Results. Registered subjects were 553 persons ranging in age from 37 to 102 years (average, 81.6 years of age). Twenty-six subjects dropped out. The number of falls and hip fractures for the 6-month period after the trial for 527 of the 553 subjects for whom related data were available were assessed. The exercise group comprised 315 subjects and the control group included 212 subjects. The cumulative number of falls of the exercise group, with 1 multiple faller omitted, was 118, and the control group recorded 121 falls. A significant intergroup difference was observed. However, the cumulative number of hip fractures was only 1 case in both groups. This difference was not statistically significant. Conclusions. The unipedal standing balance exercise is effective to prevent falls but was not shown to be statistically significant in the prevention of hip fracture in this study.

Salminen, M. J., T. J. Vahlberg, et al. (2009). "Effect of a Risk-Based Multifactorial Fall Prevention Program on the Incidence of Falls." Journal of the American Geriatrics Society **57**(4): 612-619.

To evaluate the effects of a multifactorial fall prevention program on falls and to identify the subgroups that benefit the most. Randomized controlled trial. Community-dwelling subjects who had fallen at least once during the previous 12 months. Five hundred ninety-one subjects randomized into intervention (IG) (n=293) and control (CG) (n=298) groups. A multifactorial 12-month fall prevention program. Incidence of falls. The intervention did not reduce the incidence of falls overall (incidence rate ratio (IRR) for IG vs CG=0.92, 95% confidence interval (CI)=0.72-1.19). In subgroup analyses, significant interactions between subgroups and groups (IG and CG) were found for depressive symptoms (P=.006), number of falls during the previous 12 months (P=.003), and self-perceived risk of falling (P=.045). The incidence of falls decreased in subjects with a higher number of depressive symptoms (IRR=0.50, 95% CI=0.28-0.88), whereas it increased in those with a lower number of depressive symptoms (IRR=1.20, 95% CI=0.92-1.57). The incidence of falls decreased also in those with at least three previous falls (IRR=0.59, 95% CI=0.38-0.91) compared to those with one or two previous falls (IRR=1.28, 95% CI=0.95-1.72). The intervention was also more effective in subjects with high self-perceived risk of falling (IRR=0.77, 95% CI=0.55-1.06) than in those with low self-perceived risk (IRR=1.28, 95% CI=0.88-1.86). The program was not effective in reducing falls in the total sample of community-dwelling subjects with a history of falling, but the incidence of falls decreased in participants with a higher number of depressive symptoms and in those with at least three falls.

Sattin, R. W. (2003). "Falls in older persons: risk factors and strategies for prevention."

European Journal of Public Health **13**(3): 284-285.

Schwendimann, Milisen, et al. (2006). "Fall prevention in a Swiss acute care hospital setting: Reducing multiple falls (vol 32, pg 13, 2006)." Journal of Gerontological Nursing **32**(6): 56-56.

Schwendimann, R., K. Milisen, et al. (2006). "Fall prevention in a Swiss acute care hospital setting - Reducing multiple falls." Journal of Gerontological Nursing **32**(3): 13-22.

Preventing in-hospital falls is an important goal in avoiding poor patient outcomes. In this quasi-experimental study, the authors evaluated the effectiveness of a nurse-led fall prevention program in a 300-bed Swiss hospital. Four hundred and nine patients (internal medicine) were included: intervention group (n = 198), usual-care group (n = 211). The program consisted of training nurses in the use of the Morse Fall Scale, and the implementation of 15 selected preventive interventions. In the intervention group, the proportion of patients at risk for falls was higher (p = .048), and fewer patients with multiple falls were observed (p = .009). The intervention program showed an effect in preventing multiple falls, but not first falls. The prolonged mean time to a first fall in a subgroup of fallers in the intervention group may indicate an increased awareness of the nurses and the appropriateness of the interventions used.

Scott, V. J., K. Votova, et al. (2006). "Falls prevention training for strategies and actions for independent living (SAIL)." Journal of Gerontological Nursing **32**(10): 48-56.

This article describes a quasi-experimental study on falls prevention for clients of home support services in British Columbia, Canada. The study tested a nurse-designed multifactorial intervention, delivered by community health workers. The intervention consisted of 1 day of falls surveillance and prevention training for 51 community health workers, followed by 6 months of evidence-based interventions with their clients (n = 70) using a pretested Checklist and Action Plan. Study findings showed a 43% reduction (chi(2) = 8.742, p < .01) in falls and a 44% reduction (chi(2) = 5.739, p < .05) for fallers (those who fell once or more) from the 6-month preintervention period to postintervention. The proportion of falls resulting in any injury did not decrease; however, fractures were reduced from seven in the 6-month preintervention period to one following the intervention. The results indicate this intervention is an effective and inexpensive falls prevention strategy for frail recipients of home support services.

Sherrington, C., J. C. Whitney, et al. (2008). "Effective Exercise for the Prevention of Falls: A Systematic Review and Meta-Analysis." Journal of the American Geriatrics Society **56**(12): 2234-2243.

To determine the effects of exercise on falls prevention in older people and establish whether particular trial characteristics or components of exercise programs are associated with larger reductions in falls. Systematic review with meta-analysis. Randomized controlled trials that compared fall rates in older people who undertook exercise programs with fall rates in those who did not exercise were included. Older people. General community and residential care. Fall rates. The pooled estimate of the effect of exercise was that it reduced the rate of falling by 17% (44 trials with 9,603 participants, rate ratio (RR)=0.83, 95% confidence interval (CI)=0.75-0.91, P < .001, I-2=62%). The greatest relative effects of exercise on fall rates (RR=0.58, 95% CI=0.48-0.69, 68% of between-study variability explained) were seen in

programs that included a combination of a higher total dose of exercise (> 50 hours over the trial period) and challenging balance exercises (exercises conducted while standing in which people aimed to stand with their feet closer together or on one leg, minimize use of their hands to assist, and practice controlled movements of the center of mass) and did not include a walking program. Exercise can prevent falls in older people. Greater relative effects are seen in programs that include exercises that challenge balance, use a higher dose of exercise, and do not include a walking program. Service providers can use these findings to design and implement exercise programs for falls prevention.

Simmerling, H. (2004). "Applied best-practices research: A program for falls prevention in community-dwelling seniors." Journal of Aging and Physical Activity **12**(3): 436-437.

Simpson, J. M. (2001). "Falls in older people: Risk factors and strategies for prevention." Ageing and Society **21**: 673-675.

Skelton, D. (2004). "ProFaNE: Prevention of Falls Network Europe - A 4-year thematic network." Journal of Aging and Physical Activity **12**(3): 273-274.

Skelton, D. (2004). "ProFaNE: Prevention of Falls Network Europe, a 4-year thematic network." Journal of Aging and Physical Activity **12**(3): 456-457.

Skelton, D. A., S. M. Dinan, et al. (2004). "The postural stability instructor: Qualification in the UK for effective falls prevention exercise." Journal of Aging and Physical Activity **12**(3): 375-376.

Spice, C. L., W. Morotti, et al. (2009). "The Winchester falls project: a randomised controlled trial of secondary prevention of falls in older people." Age and Ageing **38**(1): 33-40.

Background: the mortality and morbidity of falls in older people is significant, with recurrent fallers being at an increased risk. The most effective way to reduce falls in this group is not clear. Objective: to determine the effectiveness of two interventions, one based in primary care and the other in secondary care, at preventing further falls in recurrent fallers. Design: cluster randomised controlled trial. Participants: sixty-five years or over, living in the community, two or more falls in the previous year and not presenting to an emergency department with index fall. Setting: Mid Hampshire, UK. Intervention: eighteen general practices were randomly allocated to one of three groups. The primary care group was assessed by nurses in the community, using a risk factor review and subsequent targeted referral to other professionals. The secondary care group received a multi-disciplinary assessment in a day hospital followed by identified appropriate interventions. The control group received usual care. Follow-up was for 1 year. Results: five hundred and five participants were recruited. Follow-up was completed in 83% (421/505). The proportion of participants who fell again was significantly lower in the secondary care group (75%, 158/210) compared to the control group [84%, 133/159, adjusted odds ratio (OR) 0.52 (95% CI 0.35-0.79) P = 0.002]. The primary care group showed similar results to the control group [87%, 118/136, adjusted OR 1.17 (95% CI 0.57-2.37) P = 0.673]. Conclusion: a structured multi-disciplinary assessment of recurrent fallers significantly reduced the number experiencing further falls, but a community-based nurse-led assessment with targeted referral to other professionals

did not.

Stanghellini, E., M. Carnie, et al. (2007). "An innovative approach for decreasing the incidence of falls in oncology patients: The patient/family falls prevention video." Oncology Nursing Forum **34**(2): 1952.

Steinberg, M., N. Peel, et al. (2000). "Prevention of falls and near-falls in older people." Australasian Journal on Ageing **19**(1): 46-46.

Stevens, J. A. (2002). "Falls among older adults: Public health impact and prevention strategies." Generations-Journal of the American Society on Aging **26**(4): 7-14.

Stevens, J. A. (2005). "Falls among older adults - risk factors and prevention strategies." Journal of Safety Research **36**(4): 409-411.

The Journal of Safety Research has partnered with the Injury Center at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, USA, to briefly report on some of the latest findings in the research community. This report is the third in a series of CDC articles. Look for other such articles in future issue of the Journal of Safety Research. (c) 2005 National Safety Council and Elsevier Ltd. All rights reserved.

Stokes, J. M. (2009). "Falls in older people: Risk factors and strategies for prevention, 2nd edition." Australasian Journal on Ageing **28**(1): 47-47.

Sulla, S. J. and E. McMyler (2007). "Falls prevention at Mayo Clinic Rochester - A path to quality care." Journal of Nursing Care Quality **22**(2): 138-144.

Falls prevention is a complex problem. Following in the footsteps of an earlier fall prevention team, the Safe Landings Fall Prevention Team used many strategies for implementing a fall prevention/ reduction program. The tactics we used to prevent falls combined with the adoption of a fall assessment risk model are shared.

Swift, C. G. (2004). The role of medical assessment and intervention in the prevention of falls. International Symposium on Preventing Falls and Fractures in Older People, Yokohama, JAPAN.

Evidence that falls amongst older people can be prevented now requires researchers and policy makers to elucidate the most comprehensive and cost-effective approach to implementation. The syndrome of falls and fractures in later life reflects the combined age-associated influences of cumulative susceptibility to health problems and reduced adaptive reserve. The major contribution of health factors to falling has long been recognised clinically and has also emerged clearly in epidemiological studies of risk. A fall in an older adult, especially if recurrent, may be a key signal of unmet medical need and should accordingly, trigger an in-depth diagnostic process and clinical intervention by an appropriately skilled physician. Although well-designed controlled studies specifying this approach as part of a multifactorial intervention are comparatively few, recent published trials have confirmed the anticipated substantial returns in fall prevention achieved for community-dwelling patients with a history of falling. Larger-scale studies are now required, and further research is needed to achieve effective prevention strategies in institutional care. Combined calcium and vitamin D may act via neuromuscular and skeletal mechanisms in fracture prevention. The requirement for medical assessment has now appropriately been

incorporated into national and international guidelines.

Sze, P. C., W. H. Cheung, et al. (2008). "The efficacy of a multidisciplinary falls prevention clinic with an extended step-down community program." Archives of Physical Medicine and Rehabilitation **89**(7): 1329-1334.

Objective: To investigate the efficacy of a falls prevention clinic and a community step-down program in reducing the number of falls among community-dwelling elderly at high risk of fall. Design: Prospective cohort. Setting: Community. Participants: Community-dwelling elderly (N=200) were screened for risk of fall; 60 were identified as being at high risk and were referred to the intervention program. Intervention: Twelve sessions of a once-a-week falls prevention clinic, including fall evaluation, balance training, home hazard management program, and medical referrals, were provided in the first 3 months. The community step-down program, including falls prevention education, a weekly exercise class, and 2 home visitations, was provided in the following 9 months. Main Outcome Measures: Fall rate, injurious fall, and its associated medical consultation were recorded during the intervention period and the year before intervention. Balance tests included the Berg Balance Scale (BBS), Sensory Organization Test, and limits of stability test; fear of falling, as evaluated using the Activities-specific Balance Confidence (ABC) scale, was measured at baseline and after the training in the falls prevention clinic. Results: Significant reductions in fall rate (74%), injurious falls (43%), and fall-associated medical consultation (47%) were noted. Significant improvement in balance scores (BBS,  $P < .001$ ; endpoint excursion in limits of stability test,  $P = .004$ ) and fear of falling (ABC scale,  $P = .001$ ) was shown. Conclusions: The programs in the falls prevention clinic were effective in reducing the number of falls and injurious falls. The community step-down programs were crucial in maintaining the intervention effects of the falls prevention clinic.

Todd, C. and D. Skelton (2006). "Prevention of falls network Europe - A four year thematic network." European Journal of Public Health **16**: 85-85.

Todd, C. J. and L. Yardley (2006). "Prevention of Falls Network Europe (ProFaNE): developing an evidence base to change the population's behaviour." European Journal of Public Health **16**: 23-24.

Vind, A. B., H. E. Andersen, et al. (2008). An Outpatient Multifactorial Falls Prevention Intervention Does Not Reduce Falls in High-Risk Elderly Danes. 5th Congress of the European-Union-of-Geriatric-Medicine-Society, Copenhagen, DENMARK.

To evaluate the effect of multifactorial fall prevention in community-dwelling people aged 65 and older in Denmark. Randomized, controlled clinical trial. Geriatric outpatient clinic at Glostrup University Hospital. Three hundred ninety-two elderly people, mean age 74, 73.7% women, who had visited the emergency department or had been hospitalized due to a fall. Identification of general medical, cardiovascular, and physical risk factors for falls and individual intervention in the intervention group. Participants in the control group received usual care. Falls were registered prospectively in falls diaries, with monthly telephone calls for collection of data. Outcomes were fall rates and proportion of participants with falls, frequent falls, and injurious falls in 12 months. Groups were comparable at baseline. Follow-up exceeded 90.0%. A total of 422 falls were registered in the intervention group, 398 in the control group. Intention-to-treat analysis revealed no effect of the intervention

on fall rates (relative risk=1.06, 95% confidence interval (CI)=0.75-1.51), proportion with falls (odds ratio (OR)=1.20, 95% CI 0.81-1.79), frequent falls (OR=0.97, 95% CI=0.60-1.56), or injurious falls (OR=0.97, 95% CI=0.57-1.62). A program of multifactorial fall prevention aimed at elderly Danish people experiencing at least one injurious fall was not effective in preventing further falls.

von Renteln-Kruse, W. and T. Krause (2007). "Incidence of in-hospital falls in geriatric patients before and after the introduction of an interdisciplinary team-based fall-prevention intervention." Journal of the American Geriatrics Society **55**(12): 2068-2074.

Falls are among the most common unwanted events in older hospital inpatients, but evidence of effective prevention is still limited compared with that in the community and in long-term care facilities. This article describes a prevention program and its effects on the incidence of falls in geriatric hospital wards. It was a prospective cohort study with historical control including all 4,272 patients (mean age 80, 69% female) before and 2,982 (mean age 81, 69% female) after introduction of the intervention. The intervention included fall-risk assessment on admission and reassessment after a fall; risk alert; additional supervision and assistance with the patients' transfer and use of the toilet; provision of an information leaflet; individual patient and caregiver counseling; encouragement of appropriate use of eyeglasses, hearing aids, footwear, and mobility devices; and staff education. Measurements included standardized fall-incidence reporting, activity of daily living and mobility status, number of falls and injurious falls, and number of patients who fell. Before the intervention was introduced, 893 falls were recorded. After the intervention was implemented, only 468 falls were recorded (incidence rate ratio (IRR)=0.82, 95% confidence interval (CI)=0.73-0.92), 240 versus 129 total injurious falls (IRR=0.84, 95% CI=0.67-1.04), 10 versus nine falls with fracture (IRR=1.40, 95% CI=0.51-3.85) and 611 versus 330 fallers. The relative risk of falling was significantly reduced (0.77, 95% CI=0.68-0.88). A structured multifactorial intervention reduced the incidence of falls, but not injurious falls, in a hospital ward setting with existing geriatric multidisciplinary care. Improvement of functional competence and mobility may be relevant to fall prevention in older hospital inpatients.

Voukelatos, A., R. G. Cumming, et al. (2007). A randomized, controlled trial of tai chi for the prevention of falls: The central Sydney tai chi trial. 13th Meeting of the Australasian-Epidemiological-Association, Adelaide, AUSTRALIA.

Objectives: To determine the effectiveness of a 16-week community-based tai chi program in reducing falls and improving balance in people aged 60 and older. Design: Randomized, controlled trial with waiting list control group. Setting: Community in Sydney, Australia. Participants: Seven hundred two relatively healthy community-dwelling people aged 60 and older (mean age 69). Intervention: Sixteen-week program of community-based tai chi classes of 1 hour duration per week. Measurements: Falls during 16 and 24 weeks of follow-up were assessed using a calendar method. Balance was measured at baseline and 16-week follow-up using six balance tests. Results: Falls were less frequent in the tai chi group than in the control group. Using Cox regression and time to first fall, the hazard ratio after 16 weeks was 0.72 (95% confidence interval (CI) = 0.51-1.01, P = .06), and after 24 weeks it was 0.67 (95% CI = 0.49-0.93, P = .02). There was no difference in the percentage of participants who had one or more falls. There were statistically significant differences in changes in balance favoring the tai chi group on five of six

balance tests. Conclusion: Participation in once per week tai chi classes for 16 weeks can prevent falls in relatively healthy community-dwelling older people.

Waltman, N., G. Gross, et al. (2006). "Prevention of falls and osteoporotic fractures in postmenopausal breast cancer survivors." Oncology Nursing Forum **33**(2): 27.

Weatherall, M. (2004). "Prevention of falls and fall-related fractures in community-dwelling older adults: a meta-analysis of estimates of effectiveness based on recent guidelines." Internal Medicine Journal **34**(3): 102-108.

Background: Two recent falls prevention guidelines have been published but did not include quantitative estimates of effectiveness based on the published reports that were reviewed to support their recommendations. Aim: To produce quantitative estimates of effectiveness of falls prevention programs from the randomised controlled trials cited in the guidelines together with an updated search of the available published reports to August 2002. Methods: A meta-analysis of randomised controlled trials cited in falls guidelines and studies identified by an updated search of the available published reports was carried out. Randomised controlled trials were identified from the falls guidelines and a search, which met the following criteria: trials in community-dwelling older people; 1-year follow up; and outcome measures reported as the number of subjects with at least one fall or the number of subjects with a fracture. Results: The guidelines identified four studies of 'exercise as a sole intervention', which when combined with one further study identified in a search of the published reports, gave a fixed effects odds ratio (OR) favouring this strategy of 0.81 (95% confidence interval (CI) 0.58-1.14); the number of patients needed to be treated to prevent one person having a fall was 19.5. The guidelines identified seven studies of a 'multiple intervention' strategy that gave a random effects OR favouring this strategy of 0.64 (95% CI 0.47-0.88). Four further studies were identified by the search of the published reports. The updated OR favouring this intervention strategy was 0.65 (95% CI 0.52-0.81); the number of patients needed to be treated to prevent one person having a fall was 9.8. Only two studies had data for fracture and a fixed effects OR favouring falls interventions for fracture prevention was 0.50 (95% CI 0.18-1.40); the number of patients needed to be treated to prevent one person having a fracture was 45.5. Conclusion: Semiquantitative statements of evidence can both understate and overstate the effectiveness of falls prevention strategies. There is moderate evidence of efficacy for falls prevention particularly for multiple intervention strategies.

Weeks, L. E. (2007). "An examination of the impact of gender and veteran status on falls among community-dwelling seniors - Implications for targeting falls prevention activities." Family & Community Health **30**(2): 121-128.

The objective of this study was to broaden our understanding of the specific characteristics of community-dwelling seniors who are at increased risk of falling and becoming injured, by paying particular attention to gender and veteran status. The 137 respondents included 69 senior male veterans and 68 seniors in the general population. Results indicated that the veterans were at higher risk of falling than the general senior population, and were at higher risk of becoming injured after falling. Senior women were at less risk of falling and becoming injured than the veterans, but were at higher risk than the senior nonveteran men. It is imperative to target screening and falls prevention activities at these and other specific subgroups in the senior population that are at high risk of falling and becoming injured.

Weinberg, L. and T. Szturm (2004). "Relationships between perceived control beliefs and attitudes about falls and exercise among older adults in a fall prevention program." Gerontologist **44**: 184-184.

Whitehead, C. H., R. Wundke, et al. (2006). "Attitudes to falls and injury prevention: what are the barriers to implementing falls prevention strategies?" Clinical Rehabilitation **20**(6): 536-542.

Objectives: To ascertain the reasons for not taking up a fall or injury prevention strategy among older people who have sustained a fall and attended an emergency department. Subjects: As part of another trial, we identified 60 people who attended the emergency department of a public hospital with a fall. Main measures: Participants were interviewed to ascertain the reasons for not taking up a falls prevention strategy, their falls-related health state, and the likelihood of them undertaking a falls and injury prevention strategy. Results: A total of 31 (52%) of the participants had considered falls prevention after their fall. There were high levels of reluctance to undertake a strategy with 43 (72%) reluctant to take exercise classes, 10 (59%) reluctant to cease psychotropic medications, 26 (43%) reluctant to have a home safety assessment and 17 (28%) reluctant to take osteoporotic medication. When asked specifically about taking up a strategy to prevent a worsening health state, 19 (63%) of participants would take up exercise, 17 (57%) a home safety assessment, 4 of the 17 (59%) already taking implicated medications would stop and 56 (93%) would begin osteoporotic medication. These decisions did not alter when the goal for treatment was to improve a much worse health state. In participants with a lower starting health state, home safety assessments were viewed more favourably. Conclusions: There were significant obstacles to the implementation of most falls prevention guidelines examined. Treatment for osteoporosis was more acceptable to participants than exercise classes, cessation of psychotropic medication, and having a home safety assessment. Osteoporosis treatment, which had the least resistance, also had the least impact on the participants' lifestyle.

Williams, T. A., G. King, et al. (2007). "Evaluation of a falls prevention programme in an acute tertiary care hospital." Journal of Clinical Nursing **16**(2): 316-324.

Aims and objectives. To evaluate a systematic, coordinated approach to limit the severity and minimize the number of falls in an acute care hospital. Background. Patient falls are a significant cause of preventable injury and death, particularly in older patients. Best practice principles mandate that hospitals identify those patients at risk of falling and implement interventions to prevent or minimize them. Methods. A before and after design was used for the study. All patients admitted to three medical wards and a geriatric evaluation management unit were enrolled over a six-month period. Patients' risk of falling was assessed using a falls risk assessment tool and appropriate interventions implemented using a falls care plan. Data related to the number and severity of falls were obtained from the Australian Incident Monitoring System database used at the study site. Results. In this study, 1357 patient admissions were included. According to their risk category, 37% of patients (n = 496) were grouped as low risk (score = 1-10), 58% (n = 774) medium risk (score = 11-20) and 5% (n = 63) high risk (score = 21-33) for falls. The incidence of falls (per average occupied bed day) was eight per 1000 bed days for the study period. Compared with the same months in 2002/2003, there was a significant

reduction in falls from 0.95 to 0.80 (95% CI for the difference -0.14 to -0.16,  $P < 0.001$ ). Conclusions. We evaluated a systematic, coordinated approach to falls management that included a falls risk assessment tool and falls care plan in the acute care setting. Although a significant reduction in falls was found in this study, it could not be attributed to any specific interventions. Relevance to clinical practice. Preventing falls where possible is essential. Assessment of risk and use of appropriate interventions can reduce the incidence of falls.

Yang, X. J., B. Haralambous, et al. (2008). "Older Chinese Australians' understanding of falls and falls prevention: Exploring their needs for information." *Australian Journal of Primary Health* **14**(1): 36-42.

Falls-related injuries are common and costly in Australia. They have a considerable impact on an older person's health and quality of life, yet very little is known about falls-related issues in people from culturally and linguistically diverse (CALD) backgrounds. This research aimed to explore the needs of older Chinese Australians in relation to falls prevention and to help the future design of culturally-appropriate falls prevention programs among this ethnic group. Two focus group discussions were conducted in Cantonese with 15 Chinese older people in Melbourne. Findings highlighted that this group of Chinese older people had a need for further education on falls risk factors and prevention strategies, preferably in their first language. Allied health services were viewed as being unfamiliar to participants. Findings indicated that falls prevention programs need to take into account Chinese older people's special language needs and service delivery preference.

Yardley, L. (2008). "Falls in Older People: Risk Factors and Strategies for Prevention, second edition." *Ageing & Society* **28**: 299-300.

Yardley, L., F. L. Bishop, et al. (2006). "Older people's views of falls-prevention interventions in six European countries." *Gerontologist* **46**(5): 650-660.

Purpose: Our study identified factors common to a variety of populations and settings that may promote or inhibit uptake and adherence to falls-related interventions. Design and Methods: Semistructured interviews to assess perceived advantages and barriers to taking part in falls-related interventions were carried out in six European countries with 69 people aged 68 to 97 years. The sample was selected to include people with very different experiences of participation or nonparticipation in falls-related interventions, but all individuals were asked about interventions that included strength and balance training. Results: Attitudes were similar in all countries and contexts. People were motivated to participate in strength and balance training by a wide range of perceived benefits (interest and enjoyment, improved health, mood, and independence) and not just reduction of falling risk. Participation also was encouraged by a personal invitation from a health practitioner and social approval from family and friends. Barriers to participation included denial of falling risk, the belief that no additional falls-prevention measures were necessary, practical barriers to attendance at groups (e.g., transport, effort, and cost), and a dislike of group activities. Implications: Because many older people reject the idea that they are at risk of falling, the uptake of strength and balance training programs may be promoted more effectively by maximizing and emphasizing their multiple positive benefits for health and well-being. A personal invitation from a health professional to participate is important, and it also may be helpful to provide home-based programs for those who dislike or find it difficult to attend groups.

Yardley, L., M. Donovan-Hall, et al. (2006). "Older people's views of advice about falls prevention: a qualitative study." Health Education Research **21**(4): 508-517.

The aim of this study was to gain an understanding of older people's perceptions of falls prevention advice, and how best to design communications that will encourage older people to take action to prevent falls. Focus groups and interviews were carried out with 66 people aged 61-94 years recruited from a variety of settings, using falls prevention messages to stimulate discussion. Thematic analysis revealed that participants interpreted 'falls prevention' principally as meaning hazard reduction, use of aids and restriction of activity. Only one participant was aware that falls risk could be reduced by carrying out exercises to improve strength and balance. Falls prevention advice was typically regarded as useful in principle but not personally relevant or appropriate. Advice about falling was often depicted as common sense, only necessary for older or more disabled individuals, and potentially patronizing and distressing. Our findings suggest that older people do not reject falls prevention advice because of ignorance of their risk of falling, but because they see it as a potential threat to their identity and autonomy. Messages that focus on the positive benefits of improving balance may be more acceptable and effective than advice on falls prevention.

Yardley, L., S. Kirby, et al. (2008). "How likely are older people to take up different falls prevention activities?" Preventive Medicine **47**(5): 554-558.

Objective. To determine the extent to which older people are willing to engage in different falls prevention activities, and how this may vary in different sectors of the older population. Methods. A survey sent to patients aged over 54 in ten general practices in the Southampton, Bristol and Manchester areas of the UK in 2006 yielded 5,440 respondents. The survey assessed willingness to attend classes of strength and balance training (SBT), carry out SBT at home, or accept support to reduce home hazards. Participants were asked their gender, age, education, home tenure, ethnic group, and how often they had fallen during the past year. Results. over 60% of the sample would consider doing SBT at home and 36.4% said they would definitely do SBT at home. Only 22.6% would definitely attend group sessions and 41.1% would definitely not attend. Older age, recent falls and lower socioeconomic status were associated with a greater willingness to carry out SBT at home (but not in classes) and accept help with home hazards. Conclusions. Health promotion programmes should give prominence to home-based performance of SBT as a method of encouraging the entire older population to engage in falls prevention, including those most in need. (C) 2008 Elsevier Inc. All rights reserved.

Yardley, L. and S. R. Nyman (2007). "Internet provision of tailored advice on falls prevention activities for older people: a randomized controlled evaluation." Health Promotion International **22**(2): 122-128.

Falls are very common in older persons and can result in substantial disability and distress. By undertaking strength and balance training (SBT) exercises, older people can reduce their risk of falling. The Internet offers a potentially cost-effective means of disseminating information about SBT to older people and their carers. A particular advantage of using the Internet for this purpose is that the advice given can be 'tailored' to the needs of the individual. This study used a randomized controlled design to evaluate an interactive web-based program that tailored advice about undertaking SBT activities. The participants were 280 people with an age range of

65-97 years recruited by advertising the website by email and the Internet. Those randomized to the tailored advice were presented with advice tailored to their personal self-rated balance capabilities, health problems and activity preferences. Those in the control group were presented with all the advice from which the tailored advice was selected. After reading the advice, those in the tailored advice group (n = 144) had more positive attitudes ( $p < 0.01$ ) than those in the control group (n = 136), reporting greater perceived relevance of the SB T activities, greater confidence in the ability to carry them out, and hence stronger intentions to undertake the activities. This study provides an initial indication that an interactive website might offer a cost-effective way to provide personalized advice to some older people. Further research is required to determine whether website-based advice on falls prevention changes behavior as well as intentions and whether the advice needs to be supplemented by other forms of support.