Prevention (Community)

Occupational Therapy in Fall Prevention: Current Evidence and Future Directions.
Although many fall prevention recommendations exist, such as those published by the American Geriatrics Society (AGS) and the British Geriatrics Society (BGS) in 2010, the specific role of occupational therapy in these efforts is unclear. This article presents a scoping review of current published research documenting the role of occupational therapy in fall prevention interventions among community-dwelling older adults, structured by the AGS and BGS guidelines. We identified evidence for occupational therapy practitioner involvement in fall prevention in environmental modifications, exercise, and multifactorial and multicomponent interventions. Although research documenting the efficacy of occupational therapy interventions is identified as part of the Occupational Therapy Practice Framework: Domain and Process (2nd ed.; American Occupational Therapy Association, 2008), we identified little or no such research examining interventions to modify behaviors (e.g., fear of falling), manage postural hypotension, recommend appropriate footwear, and manage medications. Although occupational therapy is represented in the fall prevention research, the evidence for the profession's role in many areas is still lacking.

Relationship Between Fall-Related Efficacy and Activity Engagement in Community-Dwelling Older Adults: A Meta-Analytic Review.
Authors examined the relationship between fall-related efficacy (i.e. confidence or belief in one’s ability to perform activities without losing balance or falling) and activity and participation through a meta-analysis of studies (n = 20) comparing community-dwelling older adults’ fall related efficacy to measures of activity or participation. Results showed fall-related efficacy to be strongly related to measures of activity and performance in community-dwelling older adults. These findings highlight the potential need to address fall-related efficacy when promoting occupational engagement in this population. Future research should address the relationship of participation to fall-related efficacy and interventions targeting fall-related efficacy.

Prevention of Falls in Community-Dwelling Older Adults: U.S. Preventive Services Task Force Recommendation Statement.
The U.S. Preventive Services Task Force (USPSTF) reviewed new evidence on the effectiveness and harms of primary care-relevant interventions (multifactorial clinical assessment (with or without direct intervention), clinical education or behavioral counseling, home hazard modification and exercise or physical therapy) to prevent falls in community-dwelling older adults. Their recommendations are to provide intervention consisting of exercise or physical therapy and/or vitamin D supplementation to prevent falls to community-dwelling adults aged 65 years or older who are at increased risk for falls (grade B). For community-dwelling adults aged 65 years and older (no history of falls as primary indicator), the USPSTF does not recommend automatically performing
an in-depth multifactorial risk assessment in conjunction with comprehensive management of identified risks as the likelihood of benefit is small (grade C). For the full recommendation statement and support documents, go to www.uspreventiveservicestaskforce.org

Effect of a mobile safety alarm on going outside, feeling safe, fear of falling, and quality of life in community-living older persons: a randomized controlled trial.
The results of this trial in a group of 203 persons did not show that the alarm had added value over the usual home based alarm. There were many dropouts in both groups, especially in the intervention group. Previous research has shown that the recruitment of older, vulnerable persons for clinical trials is challenging. Also, older persons feel barriers to the use of new technologies. It is therefore important that technology for older people be based on the perspective of the users, engaging them in all parts of the development process. Some of the participants did not take the mobile alarm outside with them at all times. This might have been caused by perceived user-unfriendliness of the alarm.

A collaborative approach to fall prevention.
Authors describe the Montreal-based Geriatric Emergency Management-Falls Intervention Team (GEM-FIT) interdisciplinary project. Emergency department nurses at an inner-city hospital screened patients and invited appropriate candidates to participate in the intervention (home visits addressing modifiable risk factors identified by the Falls Assessment and Intervention Record conducted and teaching Home Support Exercise Program). Participants were assessed before, immediately and 6 months after the 12-14 week intervention. Results showed modest improvements in participant balance and gait, satisfaction with social participation and confidence. The project resulted in successful collaboration, interdisciplinary teamwork and improved service delivery to participants. Among the challenges were delayed timelines, complex issues outside the project protocol and communication difficulties. The authors make recommendations for healthcare professionals interested in initiating similar projects.

Implementing the evidence for preventing falls among community-dwelling older people: A systematic review.
This systematic review evaluated implementation strategies in relation to falls prevention among older people. Authors identified articles published between 1980 and May 2010 that evaluated falls prevention program implementation methods including training of healthcare professionals (n=6), changes to primary care/general practice management (n=3), peer or lay volunteer-delivered programs (n=3), and community awareness programs (n=3). The level of description of the implementation strategies was mixed, with some studies providing only brief details. Successful programs generally included
some aspect of training of healthcare professionals in order to change clinical practice behaviors that have been reported to be a key aspect of implementation. Peer or lay delivered programs specifically aimed at changing knowledge, attitudes, and fall-related behaviors of older people demonstrated some improvements, often related to avoiding or removing environmental hazards and extrinsic fall-risk factors. However, none of the non-professionally delivered programs included training in exercise provision, a key element of effective falls prevention strategies. Evidence on changing clinical practice within primary care was mixed which may be due to competing priorities with other conditions. Community awareness programs appeared diverse in terms of outcomes and provided no clear picture in terms of the effectiveness of this method of implementation. Translating the evidence-base into practice involves changing the attitudes and behaviours of older people, healthcare professionals and organisations. There is a need for further evaluation on how this can be best achieved.

http://www.sciencedirect.com/science/journal/00224375/42/6
Randomized controlled trial comparing tailoring methods of multimedia-based fall prevention education for community-dwelling older adults.
Fifty-three community-dwelling older adults were randomized to 2 educational groups or a control group. Multimedia-based educational interventions to increase fall threat knowledge and encourage fall prevention behaviors had two tailoring strategies: (1) vignettes presented to each participant on the basis of his or her lifestyle, as determined by interview. Scenarios reflected unique learner characteristics, including living situation, use of a mobility aid, and ability to complete activities of daily living (ADLs) independently (authenticity group) and (2) standardized handouts focused on health benefits and quality-of-life outcomes; vignettes incorporated optional educational material selected by individual participants (motivation group). Falls threat knowledge was measured at baseline and 1-month follow-up. Participants recorded prevention behaviors for 1 month. Intervention group participants showed greater knowledge gains and post-test knowledge than did control group participants. The motivation group engaged in more prevention behaviors over 1 month than did the other groups.
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3265039/?tool=pubmed

Older people's participation in and engagement with falls prevention interventions in community settings: An augment to the Cochrane systematic review.
Randomised controlled trials of fall prevention conducted in community settings have recently been systematically reviewed; however, the review did not include older people’s participation in and engagement with the interventions. This review augments previous findings by focusing on recruitment, attrition (at 12 month follow-up), adherence (to intervention protocol) and whether adherence moderated the effect of interventions on primary outcomes (rate of falls and fallers). Of the trials included, the median recruitment rate was 70.7%. At 12 months, adherence rates were ≥80% for vitamin D/calcium supplementation; ≥70% for walking and class-based exercise; 52% for individually targeted exercise; approximately 60-70% for fluid/nutrition therapy and for interventions to increase knowledge; 58-59% for home modifications; but there was no improvement for medication review/withdrawal of certain drugs. Adherence to multifactorial interventions was generally ≥75% but ranged 28-95% for individual components. The 13 studies that reported whether adherence moderated treatment effectiveness showed mixed results. Authors suggest that falls prevention interventions may be effective with only a self-motivated subgroup of individuals; however, health professionals may be able to increase engagement among older people through increased follow-up appointments and by implementing guidelines on promoting falls prevention interventions.

Implementation of a Community Pharmacy-Based Falls Prevention Program.
In this article, authors evaluated data from a randomized controlled trial examining the effectiveness of a medication review intervention delivered through community pharmacies. A total of 801 (81.7%) participated in an eligibility interview, of whom 342
(42.7%) were eligible. Baseline data collection was completed in 186 of eligible patients (54.4%), who were randomly assigned to the intervention group (n = 93) or the control group (n = 93). Resident pharmacists delivered a medication review to 73 of the patients (78.5%) in the intervention group, with 41 recommendations for changes in medication, of which 10 (24.4%) were implemented. Of the 31 prescribing physicians contacted with resident pharmacists' recommendations, 14 (45.2%) responded, and 10 (32.3%) authorized the changes. Authors conclude that establishing collaborative relationships between prescribers and pharmacists may have improved the communication in this study as well as the rate of acceptance of the recommendations by both prescribers and patients.

**Older Adults' Perceptions of Clinical Fall Prevention Programs: A Qualitative Study.**
Authors investigated motivational factors and barriers to participating in fall risk assessment and management programs among diverse, low-income, community-dwelling older adults who had experienced a fall (20 joiners and 19 non-joiners). Joiners and non-joiners of fall prevention programs were similar in their experience of loss associated with aging, core values they expressed and emotional response to falling. Two significant differences between the groups were the lack of perceived need and transportation in non-joiners. Authors conclude that older adults have to perceive a need for participation and believe that the program can benefit them in maintaining their current level of function in light of co-morbidities, already lost physical abilities and shrinking social networks.

http://www.hindawi.com/journals/jar/2011/867341/

**Older people's views in relation to risk of falling and need for intervention: A meta-ethnography.**
Authors identified 11 eligible qualitative studies to compared similarities and differences in older people's views about falls risk and intervention need. The six key concepts identified were beyond personal control, rationalizing, salience, life-change and identity, as well as taking control and self-management. Older people do not necessarily accept their given falls risk status or intervention prescriptions from healthcare professionals at face value. Consequently, options for falls prevention should be negotiated with older people by identifying their beliefs and emotions associated with being labeled ‘at-risk’ and their intervention preferences for self-management.

**Elderly Kinect**
CBC’s technology and culture show, Spark, features Marjorie Skubic’s research on the use of passive sensor networks for falls detection and prevention. Click on the individual story, Elderly Kinect.
Older people's participation in and engagement with falls prevention interventions in community settings: An augment to the Cochrane systematic review.
Randomised controlled trials of fall prevention conducted in community settings have recently been systematically reviewed; however, the review did not include older people’s participation in and engagement with the interventions. This review augments previous findings by focusing on recruitment, attrition (at 12 month follow-up), adherence (to intervention protocol) and whether adherence moderated the effect of interventions on primary outcomes (rate of falls and fallers). Of the trials included, the median recruitment rate was 70.7%. At 12 months, adherence rates were ≥80% for vitamin D/calcium supplementation; ≥70% for walking and class-based exercise; 52% for individually targeted exercise; approximately 60-70% for fluid/nutrition therapy and for interventions to increase knowledge; 58-59% for home modifications; but there was no improvement for medication review/withdrawal of certain drugs. Adherence to multifactorial interventions was generally ≥75% but ranged 28-95% for individual components. The 13 studies that reported whether adherence moderated treatment effectiveness showed mixed results. Authors suggest that falls prevention interventions may be effective with only a self-motivated subgroup of individuals; however, health professionals may be able to increase engagement among older people through increased follow-up appointments and by implementing guidelines on promoting falls prevention interventions.
http://ageing.oxfordjournals.org/content/early/2011/08/28/ageing.afr103.abstract

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The patient who falls: "It's always a trade-off".
Using the case of an community living older man who has experienced multiple falls and a hip fracture, this article addresses the consequences and etiology of falls; summarizes the evidence on predisposing factors and effective interventions; and discusses how to translate this evidence into patient care. Previous falls; strength, gait, and balance impairments; and medications are the strongest risk factors for falling. Effective single
interventions include exercise and physical therapy, cataract surgery, and medication reduction. Evidence suggests that the most effective strategy for reducing the rate of falling in community-living older adults may be intervening on multiple risk factors. Vitamin D has the strongest clinical trial evidence of benefit for preventing fractures among older men at risk. Issues involved in incorporating these evidence-based fall prevention interventions into outpatient practice are discussed, as are the trade-offs inherent in managing older patients at risk of falling. While challenges and barriers exist, fall prevention strategies can be incorporated into clinical practice.

The population approach to falls injury prevention in older people: findings of a two community trial.
Population-based falls prevention interventions were implemented in two geographically-defined and separate Australian sites. Both programs focused on increasing physical activity and raising awareness that falls are preventable. One community employed a community-based participatory research and practice model, working with local planning groups and a wide range of partners, including community organizations, health professionals, and local and state government departments, to develop and implement local prevention plans. Also, volunteer, older community members, known as Ambassadors, were trained to deliver these messages and to encourage attitudinal and behavioural changes. In contrast, the other community applied a “top-down” approach, working with a well-developed Area Health Service infrastructure including health promotion officers delivering and supporting the interventions, which were focused solely on the priority strategies of facilitating uptake of physical activity to encourage healthy ageing. Activities included ‘Come ’n Try’ physical activity expos, Fit to Function volunteer leader training, a multi-media campaign, a general practitioner referral trial, and professional leader training. The interventions in neither community substantially decreased the rate of falls-related injury, although there was some evidence of reductions in occurrence of multiple falls reported by women. In addition, there was some indication of improvements in fall-related risk factors, but the magnitudes were generally modest. Authors conclude that low intensity population-based falls prevention programs may not be as effective as those that are intensively implemented. http://www.biomedcentral.com/1471-2458/10/79

Evaluating the Cost-Effectiveness of Fall Prevention Programs that Reduce Fall-Related Hip Fractures in Older Adults.
Authors developed a model to evaluate the cost-effectiveness of seven categories of positively reviewed falls prevention interventions including withdrawal of psychotropics, group Tai Chi, vitamin D supplementation, muscle and balance exercises, home modifications, multifactorial individualized programs for all elderly people, and multifactorial individualized treatments for high-risk frail elderly people. The model included personnel and overhead costs of the interventions, varying probabilities of falls, the estimated costs of caring for individuals who have fractured hips, and the estimated
quality-adjusted life years (QALY) related to hip fractures. Medical management of psychotropics and group tai chi were the least costly and had the highest QALY, but they were also the least studied. When the authors excluded those interventions, the least expensive, highest QALY options were vitamin D supplementation and home modifications.

Community ambulation before and after hip fracture: a qualitative analysis.
This qualitative study explored mobility levels around the home and in the community before and after hip fracture by interviewing 24 patients receiving inpatient (12) or outpatient (12) rehabilitation. Inpatient rehabilitation at about 3 weeks after injury was a time of optimism where participants were looking forward to returning home not perceiving that they would have too many difficulties. In contrast, the outlook of people who had completed inpatient rehabilitation and were living in the community about 12 weeks after hip fracture was much more pessimistic feeling frustrated about their reduced level of functioning and being aware of the negative impact of the hip fracture on their lives. Authors conclude that a broader patient-centred approach to rehabilitation, incorporating biopsychosocial factors may lead to more successful integration back into the community after hip fracture.

Community Ambulation in Older Adults: Which Internal Characteristics Are Important?
Authors examined the internal characteristics of independent, healthy, cognitively intact, community living older adults (n = 113) who walked outdoors independently. The mean participant age +/- SD was 75.8+/-.7.3 years, with almost a third of the sample over 80 years. Authors assessed spatiotemporal gait parameters derived from accelerometry over 6 minutes of outdoor walking where subjects had to negotiate changing terrain while responding to attentional demands as well as undergo a battery of measures for motor, cognitive, executive, and behavioral characteristics. Results showed that factors beyond motor control contribute to independent community ambulation in older adults, reflecting the multidimensional, complex nature of the task. Self-efficacy was shown to be more relevant than executive function to gait performance, suggesting the need for a broader approach to assessment and intervention strategies.

Community falls prevention for people who call an emergency ambulance after a fall: randomised controlled trial
This randomised controlled trial included 204 adults over 60 years-old living at home or in residential care who had fallen and called an emergency ambulance but were not taken to hospital. Participants were referred to community fall prevention services or to standard medical and social care. Community fall prevention services were mainly delivered in participants’ homes (strength/balance training, home hazard assessment with provision of equipment, medication and blood pressure check and referrals); however
group sessions (twice weekly for 6 weeks) in community centres were also offered (strength/balance training, strategies for activities of daily living, nutrition, home hazards, footwear and how to get up from a fall). Of the participants who received treatment (n = 98), 79 received treatment purely at home and 19 received home treatment and participated in the group sessions. The primary outcome was the rate of falls over 12 months, ascertained from monthly diaries. Secondary outcomes were scores on the Barthel index, Nottingham extended activities of daily living scale, and falls efficacy scale at baseline and by postal questionnaire at 12 months. The incidence rates of falls per year were 3.46 in the intervention group and 7.68 in the control group. The intervention group achieved higher scores on the Barthel index and Nottingham extended activities of daily living and lower scores on the falls efficacy scale. The number of times an emergency ambulance was called because of a fall was significantly lower for the community falls prevention participants.

http://www.bmj.com/cgi/reprint/340/may11_1/c2102

How to manage falls in community dwelling older adults: a review of the evidence.
This review discusses the evidence behind the guidelines and highlights the potential benefits for older people. The key features of prevention include multidisciplinary assessment, by experienced individuals, followed by targeted multifactorial interventions. Authors’ key points include: falls in older people are common, under recognized and associated with significant morbidity and mortality; a fall may be the only presenting feature of acute illness in the elderly; screening for falls risk is controversial but the ‘get up and go’ test is a useful predictor of gait/balance problems; falls prevention requires accurate assessment combined with targeted multidisciplinary and multifactorial interventions - more than 30% risk reduction may be achieved in selected populations.

http://pmj.bmj.com/content/early/2010/04/20/pgmj.2009.093468.full.pdf

Intentions of older homebound women to reduce the risk of falling again.
Authors analyzed data from four in-home interviews with 40 women (aged 85 to 98 years) over 18 months with monthly telephone contacts between interviews. Fall history was updated at each contact. 36/40 women had fallen at home at least once before enrolling in the study, or had a subsequent or initial fall during the study. Most women explained reasons for a fall and voiced intentions and their own devices to prevent a similar fall. A few women voiced generalized preventive intentions to change health-related behaviors or habits. Women who viewed falls as unexpected events were uncertain that they could prevent a fall or felt unable to do so and voiced few preventive intentions. Authors concluded that practitioners should ask clients to explain why the fall happened and to describe changes clients have made in their daily life since the fall(s). These questions facilitate dialogue on prevention starting from the client’s situation-based perspective working towards an individualized fall-prevention plan.
Translating a multifactorial fall prevention intervention into practice: a controlled evaluation of a fall prevention clinic.
protectors in only 16% of the interviews. Authors’ findings suggest that the use of hip protectors by community-dwelling older adults is influenced by beliefs about both barriers to use and the amount of protection provided.

http://injuryprevention.bmj.com/content/16/4/235.abstract?etoc

**Determinants of disparities between perceived and physiological risk of falling among elderly people: cohort study.**
Five hundred men and women aged 70-90 years were included in this prospective cohort study with a one-year follow-up for falls. At the start of the study, all participants underwent extensive medical, physiological, and neuropsychological falls-risk assessments by trained research assistants. The number of falls in the previous year was recorded at baseline. Falls frequency during the one year follow-up was monitored with monthly falls diaries. Participants were also asked whether they had had any injuries as a result of the fall. Results showed that most people had a congruent physiological and perceived risk. However, about a third had disparities between their physiological and perceived fall risk. About 10% of the study population showed excessive levels of perceived fall risk and were classified as anxious. Despite their low physiological fall risk, almost 40% of the anxious group experienced multiple or injurious falls during the one year follow-up. Twenty per cent of the study population showed an unduly low perceived fall risk and were classified as stoics; however, the psychological profile of stoics did not indicate excessive risk taking behaviour but rather a positive attitude to life, emotional stability, and low reactivity to stress. Authors conclude that measures of both physiological and perceived fall risk should be included in fall risk assessments to allow tailoring of interventions for preventing falls in elderly people.

http://www.bmj.com/content/341/bmj.c4165.full

**Qualitative study on the impact of falling in frail older persons and family caregivers: The Whitehorse NoFalls trial: effects on fall rates and injurious fall rates.**
In this randomized control trial, authors examined the effectiveness of the Whitehorse NoFalls trial on all falls, falls resulting in injury and falls requiring medical care among community-dwelling older adults (n = 1090). Participants were assigned to one of eight groups: a combination of one or more of exercise, vision and or home hazard reduction or alternatively assignment to the control group. Authors’ key findings were:
- Exercise was effective in preventing falls among community dwelling older adults.
- Multi-component interventions did not prevent more falls than a single intervention.
- For injurious falls and falls necessitating medical care, the vision intervention was associated with fewer falls, especially when combined with exercise.
- Further research on methods to ensure intervention compliance is required.

http://ageing.oxfordjournals.org/content/early/2010/09/04/ageing.afq109.abstract
Implementing and disseminating an evidence-based program to prevent falls in older adults, Texas, 2007-2009.
The program, A Matter of Balance/Volunteer Lay Leader model addresses fear of falling and promotes physical activity in community-living, older adults in 8 classes over a 4 or 8 week period. Authors collected administrative- and participant-level data from classes conducted over a 2 year period. Program capacity was built through local Area Agency on Aging networks (AAAN) by certifying 98 master trainers and 402 lay leaders delivering the program in to 3,092 participants in 227 classes throughout the state of Texas. Authors conclude that widespread dissemination of a program to prevent falls can promote active aging among people who would otherwise be at risk for a downward cycle of health and functionality. Most local AAAN reached out to non-traditional aging partners for program delivery such as parks and recreation departments or general community centers. Authors recommend that these types of evidence-based programs be implemented where seniors live, play, or pray, to achieve healthy aging and healthier communities.
http://www.cdc.gov/pcd/issues/2010/nov/09_0224.htm

Interventions Aiming at Balance Confidence Improvement in Older Adults: An Updated Review.
This review describes interventions (n = 46) that have been tested to improve balance confidence in older community-dwelling persons. Exercise was the most frequent intervention (41/46) where several group or individual exercise types were applied and often combined, including strength, balance, endurance, flexibility and tai chi. Overall, no clear superiority of one type of exercise over the others was apparent, but the combination of strengthening and balance exercise was the most frequently used. Tai chi was effective in 4 of 8 interventions where it was used. Cognitive behavioral training and, to a lesser extent, guided relaxation and exercise imagery have shown benefits by improving balance confidence. Interventions that targeted elderly persons reporting poor balance confidence and/or those at risk for falls seemed more likely to be beneficial.
http://content.karger.com/ProdukteDB/produkte.asp?Aktion=AcceptedPapers&ProduktNr=224091

A Randomized Controlled Trial of a Multifactorial Falls Prevention Intervention for Older Fallers Presenting to Emergency Departments.
Authors measured the falls and resultant injuries over 12 months occurring in community-dwelling older people after a fall-related emergency department visit resulting in a discharged directly home. Three hundred sixty-one participants were randomized to the standard care group (received a letter indicating falls risk and recommending a visit to family physician) and 351 to the intervention group (received standard letter and individualized referrals to community-based specialist like O.T., P.T. optometrist, etc.) No significant difference was found between the two groups over the
12-month follow-up period in number of fallers or number of participants sustaining an injury from a fall.


**Multifactorial intervention to reduce falls in older people at high risk of recurrent falls: a randomized controlled trial.**


Authors evaluated the effectiveness of a multifactorial intervention in older persons (n = 217; 106 intervention, 111 usual care) living independently or in assisted living facilities with a high risk of recurrent falls. Primary outcome measures were time to first and second falls after randomization. Secondary outcome measures were fractures, activities of daily living, quality of life, and physical performance. The intervention included referrals to specialists, medication reviews and instructions for interventions like home modifications and walking aids. Results show that this intervention does not reduce falls in high-risk, cognitively intact older persons. New intervention programs and strategies to further increase adherence should be developed and tested in this target group.

http://archinte.ama-assn.org/content/vol170/issue13/index.dtl

**What Works Better for Community-Dwelling Older People at Risk to Fall? A Meta-Analysis of Multifactorial Versus Physical Exercise-Alone Interventions.**


A meta-analysis of 10 studies from 5 multifactorial interventions and 5 exercise-alone interventions meeting the prescribed inclusion criteria was conducted to compare and quantify the effectiveness of multifactorial versus exercise-alone interventions in reducing recurrent falls among community-dwelling older people. Authors found that among community-dwelling older people with a history of falls, exercise-alone interventions were significantly more effective (5 times more) in reducing recurrent falls compared to multifactorial interventions. Also, shorter interventions lasting 6 weeks to 9 months, with smaller group sizes with younger ages (age 70 verses 80 years) related to better outcomes.

http://jah.sagepub.com/cgi/rapidpdf/0898264309338298v1

**Utilization of the Seniors Falls Investigation Methodology to Identify System-Wide Causes of Falls in Community-Dwelling Seniors.**


Falls investigations of 15 seniors were done using a Seniors Falls Investigation Methodology (SFIM) which is an adapted version of a method used to examine transportation accidents. Using a systems approach expands the focus from individual risk factors to identifying the causes of falls and the circumstances surrounding them. This study provided compelling evidence that causes of falling are systemic and develop over time. It demonstrated that the systems approach is needed to expand the focus from the individual to multilayered organizational and supervisory causes. The SFIM demonstrated capability to identify causes of falls that will allow better prevention and
management programs, hence advancing seniors' safety. SFIM shows great potential for implementation in organized settings, such as hospitals and long-term care homes.


This systematic review from the Cochrane Database of Systematic Reviews contains 111 randomized controlled trials, involving more than 55 000 community living participants excluding persons with dementia. Authors found that:

- Group exercise comprised of multiple components like strength and balance training, reduced falls in older people in general, and in people known to be at higher risk of falling. Tai chi and individually prescribed multiple-component home-based exercise were also effective.
- Vitamin D is not effective in reducing falls in older people, with the possible exception of those who have vitamin D insufficiency.
- Gradual withdrawal of psychotropic medication and a comprehensive prescribing modification programme for primary care physicians both significantly reduced falls.
- Pacemakers for people with carotid sinus hypersensitivity and cataract surgery for the first affected eye both reduced rate of falls.
- Home safety interventions do not reduce falls, but they may be effective in participants who are at higher risk of falling.
- Multifactorial interventions where people receive different combinations of interventions based on an individual assessment (usually carried out by a multi-professional team) were effective in reducing the rate of falls, but not the risk of falling. Applicability of any particular approach may be highly dependent on its target population and individual components, as well as on its healthcare setting.

[http://injuryprevention.bmj.com/cgi/content/full/15/5/354#BIBL](http://injuryprevention.bmj.com/cgi/content/full/15/5/354#BIBL)

**Effects of a long-term vitamin D and calcium supplementation on falls and parameters of muscle function in community-dwelling older individuals.**

Community living seniors aged ≥70 having serum 25-hydroxyvitamin D levels below 78 nmol/l received in a double blinded fashion either 1000 mg of calcium or 1000 mg of calcium plus 800 IU of vitamin D per day over a treatment period of 12 months, which was followed by a treatment-free but still blinded observation period of 8 months. Falls were documented using diaries. Compared to calcium alone, supplementation with calcium plus vitamin D resulted in a significant decrease in the number of subjects with first falls of 27% at month 12 and 39% at month 20. Concerning secondary endpoints, there were significant improvements in quadriceps strength of 8%, a decrease in body sway of 28%, and a decrease in time needed to perform the TUG test of 11%.
A call for participants was advertised to nurses and physicians in an Emergency Department and Fracture Clinic and to local health care providers. Advertisements for the study were also placed in the hospital and Group Health Centre. A total of 201 community-dwelling patients aged >/=55 years (mean age 72 years) were allocated to the intervention group or to usual care. A research nurse screened participants in the intervention group and made appropriate referrals to physiotherapy and/or occupational therapy services. The nurse also identified medications associated with an increased risk of falls and asked primary care providers to assess the list of flagged medications. Compared to usual care, the intervention increased the number of referrals made to physiotherapy (21% vs 6.0%) and to occupational therapy (15% vs 0%). Physiotherapy interventions were tailored to each patient and included strengthening exercises, gait and balance training and referral to activities such as T’ai Chi classes. Occupational therapy interventions were also tailored to each patient and included home environmental assessment and cognitive testing. Follow through was not recorded for physiotherapy and occupational therapy interventions. There was no difference in use of high-risk medications between the intervention and usual care groups at 12 months. At 12 months, the number of falls in the intervention group was greater than in the usual care group (23% vs 11%).
http://ageing.oxfordjournals.org/cgi/reprint/afp176v2

Effects of a Multicomponent Cognitive Behavioral Group Intervention on Fear of Falling and Activity Avoidance in Community-Dwelling Older Adults: Results of a Randomized Controlled Trial.
Community-dwelling adults (280 intervention and 260 control) aged 70 and older who reported at least some fear of falling and at least some activity avoidance due to fear of falling participated in this randomized controlled trial. The intervention consisted of eight weekly sessions and a booster session which focused on instilling adaptive and realistic views on falls, reducing fall risk, and increasing activity and safe behavior. Data on fear of falling, activity avoidance, concerns about falling, perceived control over falling, and daily activity were collected at baseline and at 2, 8, and 14 months. The intervention group showed positive and durable effects on fear of falling and associated activity avoidance. Positive effects were also shown for several other fall-related outcomes, including recurrent falls.

Design of a continuous quality improvement program to prevent falls among community-dwelling older adults in an integrated healthcare system.
Authors describe how they have used theory to develop a sustainable local fall prevention program. The theory-derived plan consisted of 1) an initial leadership meeting to agree on whether creating a fall prevention program was a priority for the organization, 2) focus groups with patients and health care professionals to develop ideas for the program, 3) monthly workgroup meetings with representatives from key departments to develop a
blueprint for the program, 4) a second leadership meeting to confirm that the blueprint developed by the workgroup was satisfactory, and also to solicit feedback on ideas for program refinement. Authors concluded that the program development process is proving sustainable thus far as staff continue to monitor and address quality issues such as completion rates for home safety evaluations that are ordered for example.  
http://www.biomedcentral.com/content/pdf/1472-6963-9-206.pdf

What do community-dwelling Caucasian and South Asian 60-70 year olds think about exercise for fall prevention?

Using participant observation, 15 focus groups (n = 87; mean age = 65.7 years) and 40 individual semi-structured interviews (mean age = 64.8 years), salient beliefs were identified that influence uptake and adherence to exercise for fall prevention. The study showed that Caucasian and South Asian young older adults were generally not motivated to initiate or maintain exercise purely to help prevent falls and did not acknowledge their risk of falls. Authors conclude that fall prevention should not be the focus of uptake and adherence strategies to exercise. The wider benefits of exercise such as positive well being should be encouraged.


Trained senior volunteers are being used to inform their peers about fall prevention, but there is no direct evidence of the efficacy of peer education models for fall prevention because such models have not been compared with other models of service delivery in properly constituted trials. In quasi-experimental evaluations of community based fall prevention interventions, education by peers, as a stand alone strategy, has shown potential to increase knowledge of risk associated with falling. However, there is limited evidence that increased awareness will translate into behaviour modification. Authors indicate that more research is needed.

Preventing falls among older adults: No "one size suits all" intervention strategy.

Research conducted over the past two decades indicates that exercise effectively reduces fall risk and/or fall incidence rates; however, no “one size suits all” exercise intervention strategy exists. While there are many exercise options for older adults identified at low risk for falls, the options become fewer for those older adults identified at higher levels of fall risk. Current evidence suggests that exercise alone may not be sufficient to appreciably lower the level of fall risk in older adults identified at high risk for falls. Instead, an individually tailored exercise program that is embedded within a larger multifactorial intervention that first identifies and then prioritizes the treatment of the major risk factors contributing to the older adult’s heightened fall risk is likely to be the more effective method of addressing falls in the older adult population.
In this prospective cohort study, 60 community-dwelling elderly adults screened as being at high risk for falls were referred to a once-a-week (12 weeks total) falls prevention clinic. The community step-down program, including falls prevention education, a weekly exercise class, and 2 home visitations, was provided in the following 9 months. Significant reductions in fall rate (74%), injurious falls (43%), and fall-associated medical consultation (47%) were noted. Significant improvement in balance scores and fear of falling was shown.

Knowledge of osteoporosis risk factors and prevalence of risk factors for osteoporosis, falls, and fracture in functionally independent older adults.  
Forty-nine individuals over the age of 50 years completed a series of questionnaires and clinical testing procedures to identify osteoporosis knowledge, fall and fracture risk factors. It was found that participants with increased knowledge of risk factors presented with increased confidence performing activities of daily living, greater lower extremity strength and lower fall risk. Authors suggests that knowledge of disease processes, risk factors and strategies for prevention and management may improve patient compliance for behavioral changes necessary in successful participatory management.

Cost-effectiveness of a multidisciplinary fall prevention program in community-dwelling elderly people: A randomized controlled trial (ISRCTN 64716113).  
Senior patients visiting a Dutch emergency department because of a fall were invited to participate in this randomized, control study. The intervention group received medical and occupational therapy fall risk assessments and recommendations or referrals to programs. Analysis showed that the intervention did not have an effect on falls, daily functioning, or quality of life measures at 4 and 12 months post intervention. The multidisciplinary intervention program to prevent falls was not cost-effective compared with usual care in the Netherlands.

Preventing injury in Victorian seniors aged 65 years and older.  
This article presented injury data from Victoria, Australia along with summaries of systematic reviews assessing various falls prevention measures and concluded with the following recommended interventions:  
- Health/environmental risk factor screening and multifactorial interventions for older persons with a history of falls or known to have risk factors.  
- Individually prescribed muscle strengthening and balance retraining prescribed at home by a trained health professional.  
- Professional home hazard assessment and modification for persons with a history of falls.
Evidence is promising, but inconclusive for Tai Chi in community settings, broad multifactorial interventions based on risk factor assessment, hip protectors in care settings, and oral vitamin D supplementation between 700 – 800 IU/d for high-risk community and residential dwelling older women.

Older Persons' Perception of Risk of Falling: Implications for Fall-Prevention Campaigns.
A telephone survey with residents aged 60 and older (n=3202) from a community receiving a multifaceted five-year falls prevention program and from a comparison community was conducted five years post intervention. Residents from the intervention community were more likely than those from the comparison community to believe that falls were preventable and more likely to rate prevention of falls as a high or very high priority. There was no difference between the two sites in terms of self-perceived risk of falls, with more than 60% of respondents in both areas rating their personal risk as “low”. Although older people accepted traditional fall-prevention messages, most viewed them as not personally relevant. Focus groups indicated that messages emphasizing independence or health were favored over fall-related messages. Authors suggest that messages that promote health and independence may be more effective in campaigns.

Predictors of Adherence to Falls Interventions
Skelton D. ProFaNE Community Online 2008 April 15 [cited 2008 May 28]; Circulation: 2547
A study was conducted to determine the participant adherence rates and predictors of adherence in a multifactorial fall prevention trial. The average adherence rate for exercise classes was 58%, psychosocial groups was 25%, and lectures 33%. On average, home exercises were performed 11 times per month. Older persons with the poorest physical, psychological, and cognitive functioning abilities are less likely to adhere to programs and are at the highest risk of falls. More research is needed to understand how to engage this population.
The ProFaNE Attitudes to Falls-Related Intervention Scale (AFRIS) has been validated as a measure for the acceptability of falls prevention interventions. This can be used to modify existing programs or address specific concerns with individual participants.

The effects of usual footwear on balance amongst elderly women attending a day hospital.
This study examined the effects of footwear on balance in a sample of older women (n=100) attending a geriatric day hospital. Participants’ footwear was assessed using a footwear assessment form and a Berg Balance Scale was completed with shoes on and off. It was found that balance scores were significantly higher with shoes on for 10 of the 14 Berg subcategories. The greatest benefit of footwear was seen in those with the poorest balance. Shoe characteristics were not associated with change in scores. Authors
recommend that investigations should be conducted to assess whether particular types of footwear are associated with greater benefit.

**Impact of a multifaceted community-based falls prevention program on balance-related psychologic factors.**


Evidence is growing that psychologic factors such as fear of falling, balance confidence, and falls efficacy are associated with seniors’ health and quality of life and therefore should be included as important targets of falls prevention programs. Perceived balance and balance confidence was measured in community-dwelling adults aged 60 years and over who had participated in a 12-week multifaceted falls prevention program (Stand Up!) including 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. The program was successful in improving balance performance and had a positive impact on perceived balance; however, the program did not improve participants' balance confidence. Authors suggest that new components and/or modifications of Stand Up! are needed to achieve maximal benefits for participants in terms of physical and psychologic outcomes.

**Effect of Physical Activity Counseling on Disability in Older People: A 2-Year Randomized Controlled Trial.**


This randomized controlled trial investigated the long-term effect of physical activity counseling on instrumental activity of daily living (IADL) disability in sedentary older community-dwelling people (n = 632). The intervention group received a single individualized physical activity counseling session with supportive phone calls from a physiotherapist every 4 months for 2 years and annual lectures on physical activity. The control group received no intervention. IADL disability increased during the trial for intervention and control groups. However, subgroup analyses revealed that the intervention prevented new disability in those without IADL disability at baseline. The intervention had no effect on recovery from disability in those with baseline disability. Authors conclude that more research is needed on the usefulness of primary care–based physical activity counseling in postponing IADL disability.

**Successful Dissemination of a Community-Based Strength Training Program for Older Adults by Peer and Professional Leaders: The People Exercising Program.**


There is growing recognition that being part of a community of other older adults provides social contact and support for health behavior change. The People Exercising Program consists of an evidenced-based, progressive strength training, balance, and flexibility exercise class and a leader training and certification workshop for peers and professionals to disseminate the program in their local communities. Nearly 80% of all
potential leaders who completed the training workshops went on to establish program sites or to teach at least two 12-week strength training classes within 1 year. There were no differences in the ability of peer and professional leaders to disseminate the program successfully. Involvement of peer leaders in addition to fitness professional offers distinct advantages over traditional exercise models, including the opportunity for greater dissemination and the ability of peer leaders to serve as role models for other older adults.

**Seniors' perceptions of using hip protectors to reduce fracture risk.**
Authors of this letter to the editor reflect on a study where seniors were given four different types of hip protectors and were asked to use each type, in a randomly determined order, for 1 week. Participants were interviewed regarding their beliefs about using hip protectors before and after the trial use period. After the trial use period it was found that concerns around comfort, fit, appearance, and convenience had diminished and questions around ability to protect against injury had increased. Furthermore, study participants indicated that there wasn’t a personal need for a hip protector even though study participants were limited to individuals who had fallen within the previous year or who expressed a fear of falling.

**Systematic reviews on preventing fall-related injuries in older people.**
This review included six studies which examined interventions that targeted individuals or the environment. The relative reduction in fall-related injuries across the six studies ranged from 6% to 33%. Authors concluded that the success of the intervention depended more on measures taken to ensure uptake rather than the specific intervention itself.

Multifactorial fall prevention programs in primary care, community, or emergency care settings were evaluated for effectiveness. The overall quality of the evidence was low as most of the trials were small and many were methodologically flawed. Current evidence suggests that it may reduce the number of fallers by only a modest amount. Evidence for outcomes such as rates of falls and injuries is insufficient. Higher intensity interventions that provide treatments to address risk factors rather than information and referral may be more effective. However, it is not known if the benefits derived from these programs outweigh the costs of these interventions. Sounder studies are needed to resolve the uncertainty about the clinical effectiveness and cost effectiveness of multifactorial programs.

Falls prevention exercise programs may reduce the rate of falls by increasing strength and balance, but may also reduce the rate by increasing older persons’ awareness of falls leading to reduced physical and social activities. During the exercise program older persons may be receiving messages about their risk of falls and their responsibilities in avoiding falls. Many older persons report that falls-prevention information provokes anxiety about falling and many view activity restriction as an effective method to avoid falls. Activity restriction may be beneficial while recovering from a previous falls, but could be deleterious over a long period of time. Authors suggests that if an older person is profiled using the Selective, Optimization and Compensation Model, one could decipher if the exercise program is reducing falls as a result of increased strength and balance or a result of decreased social and physical activity.


In 13 outpatient falls clinic programs, 454 high risk clients were prescribed an average of 5.7 new or additional interventions. Interventions included home visits for environmental risk assessments, home exercise programs, day hospital or community therapy service, home aids/improvement facilitation (shower chairs, lighting, etc.), medical investigations or management, and group exercise. Sixty-one percent of eligible clients returned for the 6-month assessment. At that time, there was more than a 50% reduction in falls, multiple falls, and fall injuries and small but significant improvements evident on secondary measures of balance, leg strength, gait speed, and confidence outcomes. Average adherence to recommendations was 74.3%. Factors associated with higher adherence included being male, younger than 65, living with others, and having a caregiver.


A peer review panel reviewed 20 years of funded research and conducted a Strengths, Weaknesses, Opportunities, and Threats Analysis. CDC has invested over $24,900,000 in fall-related research and programs over 20 years resulting in research, policies and programs. Specific recommendations across the public health model, include gathering additional epidemiologic data on trends and patterns of fall-related injuries at all levels, researching risk factors by setting or subpopulation; developing and testing innovative interventions; and engaging in translation and dissemination research on best practices to increase uptake and adoption of fall prevention strategies.
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.
This study assessed 132 disease prevention and health promotion programs in Quebec for older adults to measure the extent to which an ecological approach was integrated. Authors note that intervention programs should go beyond simply targeting older adults and their caregivers to targeting their organizational, community, and political environments. The interventions examined infrequently addressed community and political levels. However, collaborative bodies such as coalitions involving multiple community stakeholders may lead to more interventions involving networking and broader engagement of community and political stakeholders.

Epidemiology and Prevention of Fall Injuries among the Elderly.
With an aging population, authors conclude that based on economic benefits, the focus around seniors falls should be on prevention rather than treatment. They suggest raising public awareness about falls, implement community education/exercise programs, develop programs for health officials to identify and rectify falls hazards, address home hazards with seniors and local hardware stores, and have a falls prevention champion physician communicate with colleagues.

Internet provision of tailored advice on falls prevention activities for older people: a randomized controlled evaluation.
Yardley L, Nyman SR. Health Promotion International 2007; 22(2): 122-128
This article compared programs disseminating information about strength and balance training exercises through the internet. There were 280 participants who participated in the study ranging in age from 65 to 97 years. Those randomized to the tailored advice received information based on their self-rated balance capabilities, health problems, and activity preferences. The control group was presented with all of the information from which the tailored advice came. Those receiving the tailored advice report greater perceived relevance of the strength balance training information, greater confidence in their ability to carry them out, and stronger intentions to do the activities. Further studies need to be done to see if stronger intentions lead to behaviour changes.
Comparison of fall risk education methods for primary prevention with community-dwelling older adults in a senior center setting.
A convenience sample was recruited at 4 local senior centers to compare 2 fall risk education methods: a class and pamphlet (CP) group (n=35) that received a one-hour class plus a pamphlet and a pamphlet only (PO) group (n=34). Questionnaires were conducted two weeks following the intervention. No significant difference in knowledge was found between groups. As for behaviour change, the CP group reported 121 changes to reduce fall risk while the PO group reported 120 changes. Subjects who had been injured by past falls were significantly more likely to report changes than those who had not fallen or were not injured by a fall. Conclusion: Both methods prompted fall risk reduction behaviors.

This article explores how publicly-funded community based organizations empower and encourage older populations to participate in physical education. It identifies the necessity for organizations to clearly translate evidence regarding attracting and maintaining participation by older persons in physical activity as well as the need to focus on the development of funded physical education programs based on applying past achievements, having clear and viable outcomes, and utilizing the advantages of cross agency operations.

Implementing a community-based falls-prevention program: from drawing board to reality.
“Stand Up!” is a 12 week program consisting of group exercise classes (2 1-hour classes/week), a home exercise module (30 minutes of practice/week), and information/discussion classes (1 hour /week) for independent community-dwelling seniors. The program was successfully implemented in 10 different community-based organizations meeting recruitment, retention, and participation goals in all locations. Analysis of program outcomes also showed that static balance and mobility improved for participants at intervention sites compared to participants at control sites. There was also a positive impact on balance confidence and fear of falling and continued exercise 9 months post intervention.

Healthy aging as an intervention to minimize injury from falls among older people.
Healthy aging is a broad concept which includes the avoidance of disease and disability, the maintenance of high physical and cognitive function, and sustained engagement of social and productive activities. This paper investigates this healthy aging paradigm to the prevention of fall-related injury. Behavioural factors that had a significant effect on the risk of hip fractures included never smoking, moderate alcohol consumption in mid to
older age, not losing weight between mid and older age, playing sports in older age, practicing a greater number of preventative medical care, and self health behaviours. Psychosocial factors with a protective effect include being married, living in present residence for 5 years or more, having private health insurance, responding proactively to stress, having higher level of life satisfaction, and engaged in social activities. Authors suggest that a whole-of-population approach can lead to greater population health gains than strategies targeting only high-risk individuals. Measures should be taken to optimize and preserve physical, social and mental wellness, independence and quality of life.

Attitudes and beliefs that predict older people’s intention to undertake strength and balance training.
A postal questionnaire or structured interview was conducted with 558 persons aged 60 to 95 years to assess their intention to participate in a strength and balance training exercise program. Intention to participate was more associated with coping appraisal than threat appraisal. Threat appraisal included falls risk factors, fear of falling, fall likelihood and fall consequences. Coping appraisal included enjoyment of the activity, improvement of good health, mood, and confidence, ability to get out and about as well as reduction of falls risk. A strong predictor of intention was a feeling that the activity was an appropriate activity for someone like themselves with family, friends and doctor approval of suitability. Authors say recruitment messages for exercise programs should emphasize enjoyment, health maintenance, mobility, and independence. The activity should be associated with positive social identity along with family, friends, and doctor approval.

Falls prevention in practice: guidance and case study.
Nazarko L. British Journal of Community Nursing 2006; 11(2): 527-29
The author of this article describes how a nurse and physiotherapist team identified and addressed falls risk factors of a 97 year-old house bound woman. Factors identified and treated were poor balance and strength, osteoarthritis of the knees and thumbs, inadequate pain control, uncorrected, poor vision, oedema of the legs and feet, unsuitable footwear and an unsuitable walking aid. The risk of falls was reduced and quality of life improved.

Evaluation of community coalitions’ ability to create safe, effective exercise classes for older adults.
Hooker SP, Cirill LA. Evaluation and Program Planning 2006; 29: 242-250
This article describes the evaluation of the Active Aging Community Task Force (AACTF) project which overlooked the development of 25 community coalitions which created exercise classes for older adults. Over a five year period exercise instructors were trained to provide safe and effective older adult exercise classes in diverse community settings. A total of 153 new exercise classes were created and over 7000 older adults participated in the classes. As a result of participating in the exercise classes, there were substantial improvements in functional fitness levels for seniors – a considerable improvement from levels exhibited at the baseline.
A comparison of falls efficacy among older United States adults living independently and in group settings: Health education implications.
A sample of 74 older persons living independently or in group settings underwent testing to measure their physical risk of falls as well as their perceived risk of falls. Results showed that there was no significant difference in physical balance scores between the adults living independently and living in group settings. Despite this lack of significant difference, those living in group settings performed daily living activities with more concern about falling than those living independently. This higher concern of falling among seniors living in group settings may lead to a decrease in activity which could then lead to less physical activity putting them at greater risk for falls in the future.
Authors indicate that implementing interventions to address this higher perceived fear of falling among older persons living in group settings should be considered.