



**Falls, Wandering, and Physical Restraints:  
Interventions for Residents with Dementia in  
Assisted Living and Nursing Homes**

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## **Abstract**

**Background:** Among the consequences of Alzheimer's disease and related dementias are falls and unsafe wandering. Sometimes, residents of assisted living and nursing homes who have these symptoms are subject to physical restraints in a misguided effort to protect them from potential harm. Assuring high quality care for residents with dementia should be informed by a thorough understanding of prevalence and risk factors, as well as the research on interventions that have the potential to protect residents from the consequences of falls and unsafe wandering. The knowledge gained from this literature review has been used to develop Alzheimer's Association dementia care practice recommendations for assisted living residences and nursing homes related to falls, wandering, and physical restraints.

**Methods:** The authors screened 109 articles published between 1994 and August 2006 for inclusion in this review of interventions related to falls, wandering, and physical restraints. Of these articles, 28 were either: 1) relevant literature reviews or 2) reported on interventions that included residents of assisted living or nursing homes with dementia, had a sample size of 10 or more residents, used an experimental or quasi-experimental design with a control condition, and reported statistical significance of findings.

**Results:** The review uncovered many experimental or quasi-experimental studies of interventions to reduce falls and their consequences. Successful interventions involve tailoring exercise programs, medication reviews, and environmental modifications to the needs of individual residents. Few studies addressed wandering. The many articles related to physical restraints showed the harm associated with their use and that restraint reduction programs do not result in increased injury to residents.

**Conclusions:** This review shows that imposing physical restraints is not good practice for protecting residents who are prone to falling or unsafe wandering. Rather, residential care facilities need to assess the individual needs and abilities of their residents and devise individually-tailored, creative strategies to address these issues. In addition, there are many health and functional problems associated with physically restraining residents, while no benefit is proven. Further research is urgently needed in the area of wandering, given the limited number of intervention studies with control conditions that are available from peer-reviewed sources. In addition, too few studies are available on effective interventions to prevent falls for those with cognitive impairments in assisted living residences and nursing homes.

## Introduction

The population with cognitive impairment, which most often results from Alzheimer's disease or related dementias, represents at least half of all residents in assisted living and nursing homes (Morris et al., 1994; Sloane et al., 2001). People with dementia experience a unique constellation of symptoms resulting from progressive decline in their brain functioning, which include memory loss, disorientation, reduced ability to communicate and perform activities of daily living, as well as psychiatric and behavioral symptoms (Qizilbash et al., 2002). Quality of care is a key concern for people with dementia because of the continuing, documented problems with care in residential settings (Wunderlich and Kohler, 2001).

Falls and unsafe wandering are two consequences of dementia that have led to use of physical restraints in a misguided attempt to prevent injury. Research shows that people with cognitive impairment are at the highest risk of being subject to restraints in nursing homes (Castle and Mor, 1998). Studies show an annual falls incidence as high as 60% among people with dementia (Shaw, 1998) and as many as 400 falls per 100 persons with dementia (Edwards and Lee, 1998). Key risk factors for falls include many conditions associated with dementia such as muscular weakness; history of falls; visual, gait, and balance deficits; impaired functioning; depression; and cognitive impairment (American Geriatrics Society, British Geriatrics Society, and American Academy of Orthopaedic Surgeons Panel on Falls Prevention, 2001). The importance of these conditions cannot be overstated in considering approaches to falls prevention, as many of the causes are quite prevalent among people with dementia. For example, it is estimated that 89% of long-term care residents with dementia experience at least some degree of mobility impairment (Williams, Williams, et al., 2005). In addition, use of antidepressants and neuroleptics is a risk factor for falls and residents with dementia often take these drugs to control symptoms of the disease.

In regard to wandering, the extent to which this affects the dementia population in long-term care is unclear for a variety of reasons, including the lack of a clear, universally accepted definition of wandering (Lai and Arthur, 2003). Thus, across the literature on people with dementia, estimates of the prevalence of wandering range from 6 to 100% (Kiely et al., 2000). Key long-term care resident characteristics associated with wandering include cognitive impairment, discomfort, medication use, experience of pain, and ability to wander (Kiely et al., 2000). Unsafe wandering and elopement have negative consequences, including injury to oneself or others, and death. Benefits of wandering can include promotion of circulation and oxygenation, exercise, and decreased contractures (Lai and Arthur, 2003).

Providing and assuring quality care for those with dementia should be informed by a thorough understanding of the research on interventions that have potential to improve service provision to residents with dementia. This paper provides a comprehensive review of the evidence that has been used to develop Alzheimer's Association dementia care practice recommendations for assisted living residences and nursing homes related to falls, wandering, and physical restraints. The paper will also be informative for consumers,

providers, and regulators seeking to improve the quality of care for residents with dementia in these settings.

## **Methods**

The authors reviewed articles from 1994 to August 2006. To identify potentially useful sources, the authors relied on a comprehensive search of PubMed, CINAHL, PsychInfo, and Ageline databases, using various combinations of relevant search terms, such as dementia, falls, restraints, wandering, nursing homes, assisted living facilities, as well as manual searches of articles' reference sections; these methods resulted in the collection of 109 articles.

These articles were reviewed and appear in the literature review only if they include long-term care facility residents with dementia, report on use of experimental or quasi-experimental research, and report the statistical significance of findings. Trials are not included in the review if they have poorly defined interventions, fewer than 10 participants or no control condition. Literature reviews were included in this review if they were no more than five years old and reported systematic methods of analyzing studies. This selection process resulted in the inclusion of 28 studies and review articles.

## **Results**

The articles in this review address care designed to prevent falls and unsafe wandering or to mitigate the consequences of these actions for residents' health and well-being. The review also includes the consequences of physical restraints and interventions designed to reduce or eliminate their use.

### Falls

The richest intervention literature relates to falls. Thirteen intervention studies were identified, with tested strategies ranging from education initiatives to individually-tailored interventions and environmental modifications. Comparative review shows that the most successful interventions are those that are designed to meet residents' individual needs. Such interventions rely on an individual assessment of a resident's abilities and needs to develop care plans that address the particular causes of that resident's falls. Further, the studies considered also suggest caution is warranted in the area of falls, as some falls interventions cause more harm than good for the population with dementia.

Studies that tested a single intervention or a uniform approach to preventing falls and related injuries had mixed, but generally unsuccessful results. A study with an intervention designed to train staff and residents about falls as well as provide an exercise program and hip protectors resulted in a significantly lower rate of falls but no difference in the number of hip fractures (Becker et al., 2003). A randomized, controlled trial conducted in New Zealand showed that a "low intensity" intervention caused more harm than good (Kerse et al., 2004). The intervention involved a falls coordinator in each nursing home, a risk assessment tool, and education about falls and falls prevention for nurses and staff. Residents of the homes implementing the low intensity intervention fell

significantly more often than those in the control group. In this study, having a dementia diagnosis did not affect the results. Authors of a meta-analysis of randomized clinical trials found that while multi-factorial falls risk and assessment and management programs generally were effective in preventing falls among older adults, two studies found that the this type of program was not effective in older adults with significant cognitive impairment (Chang et al., 2004). Yet another study involved screening and testing for blood pressure and visual acuity problems as well as an exercise program designed to improve balance gait and strength (McMurdo et al., 2000). Despite the intervention group's significantly lower postural hypotension, there were no significant differences in the number of falls or fall rate between the intervention and control group.

Several studies have focused on individual interventions to address risk factors for falls or interventions designed to mitigate falls' effects. Results of these studies have been mixed. A monitor consisting of a patch applied to residents' legs significantly reduced the number of falls and observers noted that residents with cognitive impairment frequently sat down again when they heard the alarms in their rooms (Kelly et al., 2002). It is important to note that the lead author worked for the company producing the alarm. A Cochrane review of randomized, controlled trials found hip protectors did not lead to reductions in fractures, likely due to low resident compliance rates (Parker et al., 2004). However, when randomization occurred by facility, fractures were reduced for those at high risk of falling. A UK study found that wooden, carpeted floors in nursing homes resulted in the lowest rate of fracture after falls (Simpson et al., 2004). A randomized control trial of an exercise program consisting of strength training or Tai Chi found low adherence to the program and no significant differences between the experiences of the intervention and control groups (Nowalk et al., 2001). One explanation for the results was that the uniform nature of the intervention did not appeal to individual differences and interests. Thus, Norwalk and colleagues suggest suggest individually-tailored exercise programs.

Individually-tailored programs combining both fall prevention and injury reduction appear to have the most success in accomplishing reduced falls and fractures. Such programs rely on individual assessment of a resident's abilities and needs to develop care plans that address the particular causes of that resident's falls. A literature review of 15 studies found that individually-tailored interventions significantly reduced the number of falls while studies with other types of designs did not (Gillespie et al., 2003). An important randomized controlled trial, which occurred in Sweden, used a combination of staff training, reduction of environmental hazards, and individually-tailored exercise, mobility aids, and medication management, as well as hip protectors and post-fall problem solving conferences (Jensen et al., 2003). This combination of interventions significantly reduced the number of falls for residents in the higher cognition group, but not for those with low cognition. However, the combination reduced fractures for the lower cognition group. Fewer residents in the lower cognition group adhered to the exercise program. Another, similar study targeted residents who had fallen and provided individually-tailored interventions that involved assessment, of environmental issues, personal safety issues, and use of psycho-tropic medications, as well as staff training (Ray et al., 1997). This study realized significantly reduced resident fall rates and these rates decreased with facility compliance with the assessment team's recommendations.

A commonly noted challenge in strategies to address falls is that compliance with falls interventions is more difficult as dementia advances. An Australian literature review (National Ageing Research Institute, 2004) and a couple of studies mentioned above (Jensen et al., 2003, Chang et al., 2004) found that compliance with interventions among residents with cognitive impairment is difficult to achieve, particularly for those with moderate or severe impairments. Among residents with dementia, this challenge is not a surprise, as any therapeutic intervention with this population needs to focus on staff and environmental change, rather than resident change. Thus, interventions designed to prevent complications of falls must take into account staff compliance issues.

### Wandering

Overall, there is limited empirical information related to interventions to address wandering among long-term care residents with dementia. Only five studies that addressed wandering met the inclusion criteria for this review. One examined the effects of an enhanced facility environment on nursing home residents who paced. (Cohen-Mansfield and Werner, 1998) The enhancements were two constructed scenes – one that was homelike and another that had the pictures, sounds, and smells of nature. Participants in the study spent significantly more time near the two scenes than when they were not in the corridors, but there were no significant differences in pacing behaviors. The second study, which was designed to reduce unsafe wandering, examined the effects of a regular, early-evening walking program for physically active residents with severe dementia. The study, found a 30% reduction in incidents of aggression in a dementia unit of a nursing home in the 24 hours following the walking program (Holmberg, 1997). The third study reviewed the evidence on the effects of modifying exits on wandering (Price et al., 2000). The reviewers found no randomized, controlled trials or times-series studies that met criteria for inclusion. Extant studies were subject to performance bias. Thus, the authors could not find reliable evidence on this topic.

Two comprehensive literature reviews found no interventions with strong evidence of effects on wandering. One literature review covered 40 years of studies through 2003 (Lai and Arthur, 2003). The most recent review included analyses of different types of interventions through 2005 (Robinson et al., 2006). The authors analyzed interventions that took place in the community and in nursing homes and found that several randomized, controlled trials showed a small, statistically significant reduction in restlessness immediately after residents experienced multi-sensory environments. This type of intervention stimulates a person's sense of sight, hearing, touch, taste and smell, through the use of lighting, tactile surfaces, meditative music and the odor of essential oils. The authors also found limited evidence that exercise therapy and aroma therapy reduce wandering. The authors consider the quality of evidence for all the studies they reviewed to be low.

### Physical Restraints

Residential care settings have physically restrained residents to prevent falls and wandering, among other goals. Initiation of physical restraints has been shown to occur more often when residents have cognitive impairment. (Sullivan-Marx et al, 1999) Two

extensive literature reviews document the negative effects of restraints on nursing home residents, which include agitation, infections, and physical de-conditioning (Capezuti, 2004; Castle and Mor, 1998). These reviews also show that restraints do not prevent falls and that there is no evidence to suggest that restraints were ever useful in the nursing home setting.

A literature review of 13 studies demonstrated that education and training supported by expert consultation can safely reduce use of restraints (Evans et al., 2002). Four individual studies of physical restraint reduction programs showed that removal of restraints did not result in major adverse consequences for residents or increases in use of medication or staffing. One study found that removal of night time restraints did not change the number of falls or related injuries or use of psychoactive medications (Capezuti, 1999). Another study found that non-serious falls increased with removal of restraints but serious falls did not (Ejaz et al., 1994). A third study found that likelihood of serious injury actually decreased after restraint removal and hip fracture rates did not increase (Neufeld et al., 1999). A fourth study documented that removal of physical restraints did not result in increased staffing, use of psychoactive drugs, or serious fall-related injuries (Evans et al., 1997).

Evidence suggests that successful restraint reduction programs include staff training supported by expert consultation on alternatives to restraints (Evans et al., 1997; Neufeld et al., 1999), and individualized resident assessment and implementation plans (Godkin and Onyskiv 1999).

## **Conclusion**

Residents with dementia or cognitive impairment are more likely than other residents to be subject to physical restraints because of symptoms such as wandering and falls. The available intervention literature on falls shows that those programs that rely on individual assessment of residents' abilities and needs to develop care plans that address the particular causes of falls are most successful in preventing these incidents and related injuries. Assessment and planning must take into account the residents' remaining cognitive skills because adherence to interventions such as exercise plans becomes more difficult as the severity of impairment increases. More studies are needed on effective interventions to prevent falls for those with cognitive impairments in residential long term care settings.

Unfortunately, little evidence on interventions related to wandering exists, which means that much more research is urgently needed in this area both as to causes of wandering and interventions to prevent unsafe wandering. However, as a previous literature review indicates (Tilly and Reed, 2004) person-centered care in the form of careful assessments, care planning and individualized interventions are likely to be successful in addressing unsafe wandering.

Imposition of physical restraints is not effective in addressing falls or wandering. In addition, evidence demonstrates that imposition of restraints is harmful to residents' physical and emotional health, while removal of restraints leads to no increased resident



harm. Rather than use restraints, this literature review suggests several strategies to successfully address unsafe wandering and falls among residents with dementia. In particular, findings suggest that any strategies will be enhanced and can help to foster safe mobility among residents with cognitive impairment if they tailor the approach to the individual resident's needs, abilities and preferences.

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