Supplemental Table 1. Evidence for Interventions to Prevent Falls in People With Alzheimer's Disease and Related Dementias

Author/Year	Study Objectives	Level/Design/Participants	Intervention and Outcome Measures	Results	Study Limitations
Bouwen, De Lepeleire, & Buntinx (2008)	To evaluate the impact of a staff-oriented intervention on the number of falls in residents with and without cognitive impairment.	Level I Clustered RCT *N* = 379 (94 men, 285 women; mean age = 83.1)	*Intervention* Staff training on fall risk factors and possible behavioral or environmental modifications, completion of detailed fall-risk questionnaire for each resident (control group—no intervention) *Outcome Measures* Number of fallers, number of falls	Risk of falling was nearly halved in the intervention group. No difference in fall risk reduction was found between residents with and without cognitive impairment. The difference in average number of falls per resident between the two groups was not significant.	Residents with dementia were not analyzed separately. Staff who began on the wards after the beginning of the intervention period received no training.
Christofoletti et al. (2008)	To analyze the effects of two motor interventions on the cognition and balance of institutionalized elderly people with mixed dementia.	Level I Single-blind longitudinal RCT *N* = 54 (17 men, 37 women; mean age = 74.1)	*Intervention* Group 1: Interdisciplinary program of individualized physiotherapy, group occupational therapy, and group physical education Group 2: Individualized physiotherapy only Group 3: No intervention *Outcome Measures* Cognitive functions, balance, fall risk	Interdisciplinary intervention and physiotherapy alone showed benefit for balance and risk for falls, whereas only interdisciplinary intervention showed benefit for cognitive functions.	Sample size was small, dropout rate was large, and groups were nonequivalent.
Detweiler, Kim, & Taylor (2005)	To determine the effectiveness of an intense fall-focused program provided by regular care providers.	Level III 1-group, pretest–posttest *N* = 8 (all men; mean age = 80.8)	*Intervention* Training for certified nursing assistants to provide consistent care on day and evening shifts for intense fall-focused supervision *Outcome Measures* Number and severity of falls	A significant decrease was noted in the number of falls during the intervention period. No difference in fall severity between baseline and intervention was found.	Sample was small and nonrepresentative. Total baseline and intervention periods were limited.
Hauer, Becker, Lindemann, & Beyer (2006)	To determine whether older cognitively impaired people benefit from physical training with regard to motor performance or fall risk reduction.	Level I Systematic review *N* = 11 RCTs	*Intervention* Physical training for fall prevention in a variety of settings *Outcome Measures* Muscle strength, flexibility, walking, postural control, global motor or functional performance, physical activity, number and frequency of falls	The effectiveness of physical training in patients with cognitive impairment is unclear. Effects on motor performance and reduction of falls, when reported, were most often related to improvements in gait variables.	Sample sizes were small. Dementia diagnosis was assumed. Meta-analysis could not be performed because of study heterogeneity.

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Supplemental Table 1. Evidence for Interventions to Prevent Falls in People With Alzheimer's Disease and Related Dementias (*cont.*)

Author/Year	Study Objectives	Level/Design/Participants	Intervention and Outcome Measures	Results	Study Limitations
Mackintosh & Sheppard (2005)	To assess the value and feasibility of a fall prevention program for community-dwelling older people with moderate to severe levels of dementia.	Level III 1-group, pretest–posttest $N = 64$ (43 men, 21 women; mean age = 79.6)	*Intervention* Fall prevention program embedded in healthy lifestyle dementia respite program *Outcome Measures* Number of falls, balance, aerobic capacity	No significant differences were found in outcomes measured between baseline and 6-mo follow-up.	The 50% dropout rate resulted in a small sample size for follow-up. Assessors also performed intervention.
Mirolsky-Scala & Kraemer (2009)	To describe physical therapy interventions used to improve balance, strength, and functional status and reduce fall risk for a long-term care resident with Alzheimer's dementia.	Level IV Case study $N = 1$ (85-yr-old woman)	*Intervention* Lower extremity and core therapeutic exercise; balance, gait, and assistive device training; caregiver instruction and functional maintenance program with an emphasis on activities that require implicit, rather than explicit, memory *Outcome Measures* Muscle strength, number of falls, static and dynamic standing balance, gait, functional abilities	Improved scores were obtained in all outcome measures. No documented falls occurred during the intervention or 60-day follow-up period.	Sample size was small. Confounding variables such as medication changes and practice effect were not accounted for.
Oliver et al. (2007)	To evaluate the evidence for strategies to prevent falls or fractures in residents in care homes and hospital inpatients and to investigate the effect of dementia and cognitive impairment on prevention efforts.	Level I Systematic review and meta-analysis $N = 43$ studies	*Interventions* Hip protector, removal of physical restraint, fall alarm, exercise, change in environment, calcium and vitamin D, medication review *Outcome Measures* Rate of falls, number of fallers, number of fractures	Multifaceted interventions moderately reduced the rate of falls in hospital settings. The evidence was inconclusive for multifaceted interventions in nursing homes and for single-faceted interventions in hospital and nursing homes. The results of the meta-analysis assessing effect of dementia were insignificant.	Multifaceted interventions were undefined. One study focused on people with dementia. Authors assumed that if prevalence was not mentioned in article, the prevalence was ≥70%.
Ries, Drake, & Marino (2010)	To assess the feasibility and effectiveness of a small-group balance exercise program for people with AD in a day center.	Level III 1-group pretest–posttest $N = 5$ (1 man, 4 women; age range = 81–93)	*Intervention* Balance exercise classes in day center by a physical therapist and students teaching exercises related to changes in center of gravity over base of support *Outcome Measures* Balance, gait speed, fall risk, number of falls	Balance improved in all participants. Gait speed improved in 80%, thus improving fall risk. No falls were reported during the intervention period.	Sample size was small and attrition rate for follow-up was large. Other concurrent interventions were not accounted for.

Santana-Sosa, Barriopedro, López-Mojares, Pérez, & Lucia (2008)	To determine the effectiveness of a combined training program for patients with AD in improving overall functional capacity and ability to perform ADLs.	Level I RCT *N* = 16 (6 men, 10 women; mean age = 74.5)	*Intervention* Group training sessions for joint mobility, resistance, and coordination exercises accompanied by music (control group—routine care) *Outcome Measures* Functional capacity, ADL performance, gait and balance abilities, fall risk	Functional capacity, gait and balance, and therefore fall risk were greatly improved for the intervention group. ADLs improved in both groups, but greater improvement was noted in the intervention group.	Sample size was small. Other concurrent interventions were not accounted for. Number of falls was not recorded.
Shimada, Tiedeman, Lord, & Suzuki (2009)	To examine the effectiveness of a targeted fall prevention intervention in reducing fall rates in older residents of a long-term care facility.	Level III 1-group, pretest–posttest, repeated measures *N* = 60 (10 men, 50 women; mean age = 86.6)	*Intervention* Fall prevention aide (staff) for enhanced supervision, active interventions with residents, environmental modifications *Outcome Measures* Number of falls and fallers, physical and cognitive functioning, troublesome behaviors	Total number of falls and fallers was significantly reduced. Troublesome behaviors also decreased, but no significant change was found in cognitive functioning.	Sample was small and nonrepresentative. No control group was used. Only 48% of participants had dementia, so results may not be generalizable.
Stenvall et al. (2007)	To evaluate whether a postoperative multidisciplinary intervention program could reduce inpatient falls and fall-related injuries after a femoral neck fracture in a hospital unit specializing in geriatric orthopedic patients.	Level I RCT *N* = 199 (125 men, 74 women; age ≥70)	*Intervention* Patient assessment, joint goal setting, and rehabilitation by a multidisciplinary team with focus on prevention, daily routine, and nutrition; home visit by occupational and/or physical therapist (control group—usual care) *Outcome Measures* Number of falls and fallers, type of injury, length of hospitalization	The intervention group had fewer falls overall distributed over fewer fallers, as well as fewer serious injuries and shorter overall hospital stays.	Fall registration was not blinded according to group allocation. Only 18% of the sample had Alzheimer's dementia.
Tilly & Reed (2008)	To review evidence of interventions designed to reduce falls, wandering, and physical restraints for people with dementia in assisted living and nursing homes.	Level I Systematic review *N* = 28 studies	*Interventions* Staff and resident education, exercise programs, tai chi, hip protectors, falls coordinator, fall risk assessment tools, visual and cardiovascular testing, leg alarms, environmental hazard reduction, mobility aids, medication management, postfall analyses	Results generally favored individually tailored programs that included combined fall prevention and injury reduction for reducing fall risk. Studies that tested a single intervention or uniform approach to fall prevention had mixed but generally unfavorable results.	Most studies had small sample sizes, and few were randomized or controlled. Many lacked statistical reporting.

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Author/Year	Study Objectives	Level/Design/Participants	Intervention and Outcome Measures	Results	Study Limitations
			Outcome Measures Number of resident falls and fractures		

Note. AD = Alzheimer's disease; ADLs = activities of daily living; RCT = randomized controlled trial.

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