

# Preventing Falls in Older Adults with Dementia

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With an absence of clear guidelines for fall prevention in these patients, providers must apply their clinical knowledge and experience to individualize general preventive strategies.

**D**efined as an event that results in a person's unintentional coming to rest on the ground, floor, or other lower level,<sup>1</sup> falls among older adults represent a major health concern and are responsible for considerable mortality, morbidity, and reduced functioning. More than one third of community living, older adults (aged 65 years and older) fall each year,<sup>1,2</sup> and for half of this population the falls are recurrent.<sup>3</sup> For individuals living in long-term care facilities, the incidence of falls and fall-related injuries is approximately three times the rate for community dwelling, older adults.<sup>4</sup>

Dementia is prevalent both in long-term care settings (such as nursing homes and assisted living facilities) and among older individuals. The prevalence increases with advancing age and institutionalization—skyrocketing from 3% to 11% in community dwelling adults aged 65 and older to 47% in the oldest, institutionalized groups in some studies.<sup>5,6</sup> Rovner and colleagues found that 67% of 454 patients consecutively admitted to one nursing home had a dementia syndrome.<sup>7</sup> Assisted living facilities, though typically depicted as residential settings for cognitively intact older people with minor func-

tional limitations, can have dementia rates that rival those in nursing homes. One recent study estimated that 68% of assisted living residents in central Maryland had dementia.<sup>8</sup>

Dementia is considered an independent risk factor for falling.<sup>9</sup> As many as 30% of patients with early-stage dementia and up to 75% of patients who are institutionalized with dementia experience a fall during a one-year period.<sup>10</sup> Even with these troubling statistics, there is limited information available about the risk factors and prevention strategies unique to older adults with dementia. This article discusses the fall-related clinical issues in patients with dementia, paying particular attention to those who reside in nursing homes and assisted living facilities.

## CONSEQUENCES OF FALLS IN OLDER ADULTS

Falls and their related consequences are a leading cause of death in older adults.<sup>11</sup> According to the CDC's Web-Based Injury Statistics and Query Reporting System (which compiles data from the National Center for Injury Prevention and Control), in 2005, nearly 16,000 people aged 65 and older died from injuries related to falls. And some 1.8 million older adults were treated in hospital emergency departments for fall-related injuries, with more than 433,000 of them admitted.

Approximately 2.9% of falls result in hip fracture.<sup>12</sup> Elderly individuals in nursing homes have a disproportionately high incidence of hip fracture

and have been shown to have higher mortality rates after hip fracture than community dwelling elders.<sup>13</sup>

Falls also are a leading cause of head injury in the elderly population. It has been estimated that 73% of all head injuries in people older than age 65 are the result of falls.<sup>14</sup> Older people are at increased risk for subdural bleeds even with less severe injuries, as their bridging veins are more vulnerable to tearing due to the brain atrophy. In fact, subdural hematomas are common consequences of falls in the aging population.<sup>15,16</sup>

After experiencing a fall, elderly people often develop an anxiety to a potential future fall. One study indicated that approximately one third of 487 community dwelling, elderly adults developed a fear of falling after sustaining a fall and experienced a greater increase in balance, gait, and cognitive disorders over time—which ultimately resulted in a decreased level of mobility.<sup>17</sup>

The financial aspect of fall-related injuries is of serious significance. The total cost of fall-related injuries for people aged 65 and older was \$19.2 billion in 2000,<sup>18</sup> and this cost is expected to reach at least \$32.4 billion by 2020.<sup>19</sup> Indirect costs—related to labor, equipment, or quality of life—are not included in these figures. Additionally, with the risk of legal action being highest in patients whose falls are associated with serious injury, the costs of risk management, legal fees, and settlement awards add to the substantial indirect expenses related to falls.<sup>20</sup>

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# PREVENTING FALLS IN DEMENTIA

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## PRECIPITATING FACTORS FOR FALLS IN DEMENTIA

Falls in the elderly population generally are associated with the interaction of multiple intrinsic and extrinsic factors (Table 1). Intrinsic factors include diseases, cognitive decline, medications, and sensory deficits. Faulty equipment, restraints, poor lighting, ill fitting clothing, and improper shoes are examples of extrinsic factors. Such unanticipated medical events as stroke, seizures, and cardiac arrhythmias also can precipitate falls.

Although most falls do not result in serious injury, older people with dementia living in nursing homes fall more often than their counterparts without dementia, leaving them with a higher overall risk of sustaining injurious falls over time.<sup>9</sup> Patients with dementia also are more likely to sustain fractures when falling.<sup>21-24</sup> Muscle weakness in the lower extremities can couple with the disturbances in equilibrium, limb coordination, and neurovascular stability that affect older adults with cognitive decline to increase their fall risk.<sup>25-27</sup>

In addition to cognitive decline, patients with dementia exhibit neuropsychiatric symptoms, which often result in aggressive behaviors.<sup>28-30</sup> Aggression generally causes increased activity, which puts them at high risk for falls. Various psychotropic and nonpsychotropic agents used to treat neuropsychiatric and medical conditions consistently are associated with falls.<sup>31,32</sup> Notably, despite fewer extrapyramidal adverse effects, atypical antipsychotics are not associated with fewer falls than conventional antipsychotics.<sup>33</sup> Additionally, although the risk of falls among nursing home residents taking short-acting benzodiazepines is lower than that among those taking long-acting agents, these drugs are associated with an increased risk of nocturnal falls.<sup>34</sup> Furthermore, a

meta-analysis indicated that digoxin, type IA antiarrhythmics, and diuretics have been associated weakly with falls in elders. It also found that older adults taking more than three or four medications were at increased risk for recurrent falls.<sup>35</sup>

Multiple comorbid medical problems may contribute to falls. One study found that diabetes mellitus is an independent risk factor for falls among elderly nursing home residents.<sup>36</sup>

Visual impairment is another contributor. While research has shown that standard measures of visual acuity and visual field size are fair predictors of falls, adequate depth perception and distant-edge-contrast sensitivity, in particular, appear to be important for maintaining balance and detecting and avoiding hazards in the environment.<sup>37,38</sup>

Along with wandering, relocation has been associated with an increased risk for falls in older adults with dementia.<sup>39,40</sup> In one study, the incidence of falling doubled after nursing home residents were relocated to a new facility.<sup>40</sup> The continued use of restraints in long-term care facilities is based on the widely held belief that restraint reduction will lead to fall-related incidents and injuries. Capezuti and colleagues reported, however, that physical restraint removal did not cause an increase in falls or subsequent fall-related injury in older nursing home residents.<sup>41</sup> The same group of researchers also found that the use of bilateral side rails did not appear to reduce significantly the likelihood of falls, fall recurrence, or serious injuries.<sup>42</sup>

Based on our clinical experience, we note that aspects of the prior occupation of a patient with dementia may put him or her at risk for falls. For example, a patient who used to be a plumber may go beneath a sink basin, placing himself at risk for a fall as he attempts to get up.

**Table 1. Factors associated with fall risk in older adults with dementia**

### Dementia-specific factors

- Aggressive behaviors
- Aspects of a patient's prior occupation
- Cognitive decline
- Medications
- Physical restraints
- Relocation
- Wandering

### General factors

- Diabetes
- Environmental hazards, such as poor lighting
- Impaired gait and balance
- Neurovascular instability
- Prior falls
- Visual impairment

## PREVENTING FALLS

The goal of fall prevention strategies is to develop interventions that minimize or eliminate known risk or precipitating factors. Strategies for minimizing fall-related injury also should be included, especially for patients with dementia. The first step in developing a prevention program is to calculate fall risk.

Multiple assessment tools are available for quantifying fall risk. Perell and colleagues reviewed these scales and identified those that can be used with confidence as part of an effective fall prevention program.<sup>43</sup> Since little is known about the fall-related factors that are unique to older adults with dementia, however, quantifying fall risk and applying appropriate prevention strategies in these patients can prove more difficult. For example, an interdisciplinary, multifactorial prevention program aimed at less cognitively impaired adults in residential care facilities yielded re-

duced falls and fractures—but not in residents with more severe cognitive impairment.<sup>44,45</sup>

On a positive note, in a population-based study, Kallin and colleagues reported that the factors most strongly associated with falls among older adults with cognitive impairments were: (1) the ability to get up from a chair, (2) previous falls, (3) the need for help when walking, and (4) hyperactive symptoms.<sup>46</sup> They concluded that an intervention for this group probably would have to include treatment of psychiatric and behavioral symptoms, improvement of gait and balance, adjustment of drug therapy, and staff supervision.<sup>45</sup> In a small study, investigators used trained nursing aides to provide focused supervision of high risk fall patients on a dementia unit and demonstrated a decrease in fall severity.<sup>47</sup>

In addition to larger fall prevention program undertakings (such as adequate treatment of patients' neuropsychiatric symptoms and staff education), smaller adjustments (such as the use of nonslip mats) can minimize fall risk and related injuries among residents with dementia in assisted living facilities, nursing homes, and dementia care programs (Table 2). Establishing an interdisciplinary committee to review and oversee facility-wide and patient-specific fall prevention strategies is one way to streamline the approach.

An important step toward fall prevention is performing an osteoporosis evaluation for elderly patients determined to be at risk for falling. Calcium and vitamin D supplementation possibly can reduce fracture risk if a fall is sustained.<sup>48,49</sup> The use of hip protectors seems to reduce the risk of hip fracture effectively and has been found to be cost saving among patients in nursing home who are at high risk for falls.<sup>50-52</sup> Various types

<b>Table 2. Possible strategies to minimize fall risk and related injuries in older adults with dementia</b>	
<b>Dementia-specific strategies</b>	
<ul style="list-style-type: none"> <li>• Adequate treatment of neuropsychiatric symptoms</li> <li>• Comprehensive and regular medication review</li> <li>• Minimum use of physical restraints</li> <li>• Toileting program</li> <li>• Use of bed and chair alarm</li> <li>• Use of hip protector</li> <li>• Use of mattress only or a low bed</li> </ul>	
<b>General strategies</b>	
<ul style="list-style-type: none"> <li>• Appropriate footwear with good traction</li> <li>• Appropriate use of personal safety devices</li> <li>• Establishment of interdisciplinary fall review committee</li> <li>• Exercise programs (both general and specialized ones)</li> <li>• Fall preventive milieu (adequate lighting, flooring, railing, etc.)</li> <li>• Minimization of potential environmental hazards</li> <li>• Osteoporosis management</li> <li>• Staff education about fall risk and interventions</li> <li>• Use of comprehensive prefall and postfall assessment tools</li> <li>• Use of nonslip mat</li> </ul>	

of hip protectors are available, including energy shunting ones, which are made of durable plastic and are designed to divert a direct impact away from the greater trochanter onto surrounding soft tissue. Although soft, absorbing hip pads do offer some peak force reduction, energy shunting systems are likely superior in preventing hip fractures.<sup>53</sup>

In designing a safer environment for patients at risk for falling, the type of flooring should be considered. Simpson and colleagues implicated carpeting placed over wood floors as the flooring type associated with the lowest number of fractures.<sup>54</sup>

Extensive general guidelines for the prevention of falls in older adults, with or without dementia, were issued as a joint endeavor between the American and British Geriatrics Societies and the American Academy of Orthopedic Surgeons Panel on Falls Prevention in 2001.<sup>51</sup>

## CONCLUSIONS

Further research into effective fall prevention strategies for older adults with dementia is needed. Such research should focus especially on stratifying interventions based on levels of cognitive impairment. In the meantime, clinicians and caregivers need to employ individualized, pragmatic strategies based on general guidelines and clinical experience to reduce fall risk and related injuries. ●

### Author disclosures

The authors report no actual or potential conflicts of interest with regard to this article.

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