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It Takes a Village to Prevent Falls: Reconceptualizing Fall Prevention and Management for Older Adults

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Abstract

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

Keywords

accidental falls; fall prevention; chronic care model; implementation research; program evaluation

INTRODUCTION

Falls are defined as “an unexpected event in which participants come to rest on the ground, floor, or lower level.”¹ About one-quarter of community-dwelling older adults fall every

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Competing interests

The authors have no competing financial interests with respect to this manuscript.

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year,² resulting in annual medical costs of at least \$19 billion in the United States alone.³ While most falls do not result in injury, 5–10% of falls cause serious injuries such as major head trauma, lacerations, or fractures.⁴ Frequent falls predict nursing home placement⁵ and may cause older adults to restrict their daily activities.

Over the past 30 years, researchers have made remarkable progress in developing effective interventions to prevent and manage falls among older adults.⁶ Meta-analyses of randomized controlled trials show benefits of multifactorial fall prevention activities that include fall risk assessment, medical management, physical activity, and home modification.^{6, 7} Although very recent meta-analyses suggest that the magnitude of fall reduction generated by multifactorial programs may be smaller than previously thought,^{8–10} the benefits are still clinically important. Fall prevention and management (FP/M) activities are generally grouped into three categories based on the individual's health and functional status. These include:

1. Health promotion strategies that encourage physical activity incorporating balance, flexibility, and strength training and home environment self-assessments for healthy older adults;
2. Multifactorial fall risk assessment and management, including medical review, adapted physical activity, and in-depth home assessment and modification, which are most appropriate for those at higher risk for falls due to underlying medical conditions or functional impairments; and
3. Minimizing the consequences of falls (e.g., use of hip protectors or medications to preserve bone mineral density), a strategy for those at the highest risk for falls and/or for those with a high underlying risk of injury if a fall occurs (e.g., patients with osteoporosis).

Implementing and sustaining these FP/M strategies is often difficult. In addition to fundamental issues in implementing research into practice,¹¹ a major challenge specific to FP/M is that requisite activities can occur in multiple settings (e.g., outpatient medical care, senior center, home-based services), and be carried out by multiple provider types (e.g., physicians, nurses, social workers, rehabilitation therapists, physical activity instructors) over multiple intervals. Traditionally, each aspect of fall prevention has operated in relative isolation from other aspects. For example, community senior centers offer exercise classes, medical providers perform medical management, and home health agencies provide home safety evaluations with community agencies or private companies installing recommended equipment (e.g., grab bars). There is no guarantee that an older adult, coming into contact with any one of these services, will receive the others required to replicate activities shown to reduce falls in randomized, controlled trials.

It seems clear, then, that successful implementation of fall prevention activities in community settings requires a new approach involving a higher degree of coordination across settings and providers, as well as more effective collaboration with older adults and their caregivers. Given limited resources, it is unlikely that every possible combination of providers and sites for a new, linked set of fall prevention activities will be tested for efficacy in reducing falls in randomized, controlled trials. Therefore, we believe that a new set of concepts are needed to judge the adequacy of linked FP/M activities implemented in applied settings.

This article describes FP/M from a chronic care perspective to help researchers, practitioners, and policy makers better understand the strengths and weaknesses of existing programs and services in their geographic area. Falls are obviously acute events, but the underlying risk for falls is often a result of chronic problems. The collective result of these

problems is a chronic state we call “fall risk.” Fall risk has important parallels with other chronic conditions, such as diabetes. In both cases, the risk of an acute event (a heart attack in the case of diabetes, or a fall in the case of fall risk), can be reduced through individuals and their providers taking action on the sources of risk, such as changing lifestyle or adopting risk-reducing interventions (e.g., medication for diabetes, or gait and balance training for fall risk).

WHO’S INNOVATIVE CARE FOR CHRONIC CONDITIONS (ICCC) FRAMEWORK

Given that the life-course of chronic health problems, such as fall risk, depends on an affected individual’s own actions and engagement with various providers, those involved in the solution must extend beyond the medical domain. The World Health Organization Innovative Care for Chronic Conditions (ICCC) model (Figure 1),¹² based on the Chronic Care Model,¹³ provides a framework for rethinking chronic care service delivery by emphasizing changes in health care, encouraging consumer self-management activities, and improving linkages to community resources.^{14, 15} The value of describing collaborative FP/M through the ICCC approach lies in the model’s connections between ongoing activities at the consumer and provider levels to community-level participation as appropriate, operating in a supportive policy environment. Successful linkages can lead to older adults and caregivers who are informed, motivated, and prepared to manage and reduce fall risk. Below we describe examples of current FP/M efforts that are consistent with specific ICCC principles. Examples are taken from our collective experience and knowledge of the literature, supplemented by targeted literature searches using Medline, PubMed, Google, and Google Scholar. While we are most familiar with the status of fall prevention activities in the United States, we have included examples of relevant international activities as well.

Operating Principles in Health Care Organizations

Encourage quality through leadership and incentives—In the US, there are currently two major organized attempts to improve the quality of care for falls. First is the US Medicare system’s Physician Quality Reporting Initiative,¹⁶ in which physicians receive up to a 1.5% bonus if they report on certain quality measures, including screening patients for future fall risk at least once in 12 months.¹⁷ Additionally, the US Department of Veterans Affairs (VA), which provides health care for almost 5.5 million veterans nationally,¹⁸ recently added two new quality indicators related to falls within broader measures on the quality of geriatric care. These indicators, derived from the Assessing Care of Vulnerable Elders (ACOVE) project,¹⁹ include whether older veterans were asked about previous falls, and whether a basic evaluation for those with a fall history included the following items: circumstances of the fall; current medications; relevant chronic conditions; diagnostic plans/therapeutic recommendations; and documentation of action taken as appropriate. Although financial incentives are not currently tied to these indicators, results may serve to increase quality improvement activities geared toward veterans’ health on this key issue.

Organize and equip healthcare teams, support self-management and prevention, and promote continuity/coordination—The Assessing Care of Vulnerable Elders-2 (ACOVE-2) project exemplifies the ICCC principles of organizing healthcare teams and supporting patient self-management.²⁰ ACOVE-2 was a clinical intervention to improve to the quality of care for community-dwelling adults aged 75 and older with falls, incontinence, and cognitive impairment.²¹ First, physicians received three hours of education on efficient approaches to addressing each condition. Patients were then screened for the target conditions prior to a scheduled visit. On the visit date, physicians

received the results of the screen with a condition-specific structured visit form. This form guided physicians to 1) consider important elements of the history and physical examination, and 2) develop an intervention plan by suggesting diagnostic tests and treatments and enabling automatic orders for simple procedures (e.g., obtaining orthostatic blood pressures) to be completed by allied professionals. Consistent with ICCC principles, patient education materials including community resource information (e.g., physical activity programs) were available in examination rooms, supporting patient self-management. This practice redesign intervention demonstrated improved quality of care for falls compared to screening for falls without practice redesign.²⁰ Building on this work, the *ACOVEprime* project is implementing additional quality improvement processes for falls and incontinence by collaborating more with allied professionals and (where available) using electronic health records for screening and documentation. Some practices in *ACOVEprime* are scheduling planned follow-up visits for patients with falls, consistent with the ICCC principle of improving continuity and coordination.

Use information systems—Previous research has suggested that emergency medical services²² and geographic information systems²³ can be used to identify individuals with injurious falls and to monitor long term effects of prevention strategies. However, to our knowledge, data such as these have not been routinely used to date. More progress is being made in developing clinical information systems to support FP/M, both in the US and abroad.²⁴

Operating principles in the community

Mobilize and coordinate resources—Interventions to prevent falls that mobilize and coordinate resources have been summarized in a recent Cochrane meta-analysis of five controlled before-after studies.²⁵ An example is Australia's *Stay on your Feet* program, which served 80,000 community elders and invoked multiple strategies for success, including community education, home hazard reduction, state and local policy development, social marketing approaches, and working with clinicians and other professionals.²⁶ Using administrative data on fall-related hospitalizations, evaluators documented rates of self-reported falls among a sample of intervention and control participants, finding that relative reduction in fall rates was consistent with the significant reduction in fall-related hospitalizations.²⁶ Program sustainability was assessed five years post-intervention showing evidence of changed practices among health professionals and older adults.²⁷

Provide complementary services—Several programs have been developed that offer FP/M interventions complementing services traditionally offered by healthcare providers (e.g., medical management). Two key complementary services provided by community-based agencies include physical activity classes at various intensity levels and assessment and modification of the home environment to reduce hazards that may contribute to falls. Community physical activity programs focusing on muscle strengthening, flexibility, and balance retraining using trained health professionals offer the most promise for reducing falls.⁷ Program examples based on these elements and implemented in community-based settings include Tai Chi for older adults²⁸ and *FallProof*.²⁹ Evidence-based FP/M activities are also being implemented in senior centers through the *Step by Step* program.^{30,31} This program trained senior center staff to provide group education on fall risk reduction, physical activity, and monitoring interventions based on participants' fall risk assessments with evaluation results forthcoming.³⁰

The home environment might be overlooked by health and social care providers when assessing for fall risk. However, up to three-quarters of falls by community elders occur in and around the home.^{32, 33} Home modification is defined as converting or adapting the

environment to make performing tasks easier, reduce accidents, and support independent living within communities of choice.³⁴ Such changes include removing hazards, adding special features or assistive devices, moving furnishings, changing where activities occur, and making renovations.³⁵ Professional home assessment, consumer education, and installation of home modifications, as part of an integrated risk management intervention, has contributed to improved functioning, decreased fear of falls, and reduced incidence of falls in community elders.^{7, 36, 37} This is especially true for those with a history of falls.³⁸ Implementing home modifications requires both behavioral and environmental changes by the older adult, including a willingness to alter the home and subsequently use devices and adaptations once present.

Raise awareness, reduce stigma, and encourage better outcomes through leadership and support—Raising awareness and reducing stigma associated with falls is critical because older adults may be unaware that preventive interventions can improve outcomes. Older adults may also not report their falls to others due to fear of being labeled as frail or disabled. Current research suggests that FP/M messages geared toward older adults should promote health and independence rather than focusing on reducing falls.³⁹ The Archstone Foundation’s Senior Fall Prevention Programs Initiative is a recent effort to raise awareness, reduce stigma, and encourage better outcomes by funding two types of community projects. First, Archstone’s Program Expansion grants fund California-based community agencies that are expanding existing FP/M activities using evidence-based practices and collaborative partnerships. Second, their Coalition Development grants support multiple and diverse organizations to mobilize new and existing FP/M efforts and facilitate increased awareness of falls-related health promotion activities. Both of these projects are developing community-level leadership and support to improve health and functional outcomes, directly or indirectly, for community elders at risk for falls.

Operating principles in the policy environment

Many stakeholders who work to improve visibility and accessibility of FP/M programs and services are also engaged in policy activities at the local, state, and federal levels. The policy environment is distinct from community and health care organizations in the ICCC model as it can facilitate or impede activities carried out by organizations. Below are examples of entities generating a supportive policy environment for FP/M and the strategies they are employing.

Provide leadership and advocacy, strengthen partnerships, and integrate policies—Several entities provide leadership and advocacy to create and strengthen working partnerships within and between non-profit and governmental agencies at local and state levels – aging, health care, public health, social services, mental health, housing, transportation, emergency services, urban planning – and private business sectors, such as fitness clubs and new housing developers. The goal of these policy efforts is to integrate disparate FP/M policies and collectively achieve public health goals related to reducing fall incidence. Examples include local and state level leadership and advocacy through the California Fall Prevention Center of Excellence’s⁴⁰ *StopFalls Network* and recent Fall Prevention Summit, and the US National Council on Aging’s *FallsFree Coalition* that involves interested organizations nationally.⁴¹ Their activities have focused primarily on harnessing organizational interest for FP/M, creating viable policy solutions that involve multiple stakeholders including older adult consumers, and outlining feasible implementation strategies – critical activities given that current efforts operate in a relatively decentralized environment. One small, but powerful policy activity resulting from leadership and advocacy efforts is the creation of local and state government proclamations for a Fall Prevention Awareness day or week, usually coinciding with the first week in autumn.⁴²

US federal entities also have provided significant leadership, resulting in strengthened partnerships and policy changes. The US Administration on Aging (AoA) spearheaded the Evidence-Based Disease Prevention Grants Program in 2003, which funded an effectiveness study of *A Matter of Balance* program using a volunteer lay leader model⁴³ and the *Step by Step* program described earlier. In 2006, AoA funded the state of Connecticut to expand the reach of *Step by Step* to eight additional US states to implement the *Matter of Balance-Volunteer Lay Leader* model program.

From the US legislative realm, two key policies that have been successfully integrated at federal, state, and local levels are the Fair Housing Amendments Act (1989) and the Americans with Disabilities Act (1990). Both acts champion the overall goal of minimizing barriers within the built environment. Mandates from these acts have been highly institutionalized, contributing to fall prevention through increased access to assistive devices (e.g., grab bars in bathrooms), promoting walkway accessibility (e.g., accessible routes within housing complexes and widened doorways), and removing physical and or structural barriers (e.g., adding curb cuts). In addition, some states have opted to increase accessibility and community walkability through other structural features, such as in-pavement lighting and audible crosswalks with countdowns, street medians, and clear signage. A key limitation of these policies is that they are restricted to public and or multi-use dwellings, leaving out the 75% of community elders who live in single-family homes, duplexes, and triplexes.⁴⁴ Outside the US, New Zealand has developed an ambitious policy to prevent injuries from falls.⁴⁵ Key interventions in their National Strategy include leadership building in fall prevention; education and dissemination; developing programs based on best practices; environmental modification; and resource reallocation.

Support legislative frameworks, develop and allocate human resources, and promote consistent financing—Policy-focused leadership and advocacy efforts, if successful, result in targeted legislation that creates consistent financing mechanisms and human resource development. In the US, state and national level legislation has been proposed to strengthen FP/M infrastructure, with the recent passage of bills in the state of Maine⁴⁶ and the US Senate’s Safety of Seniors Act of 2007.⁴⁷ These bills promote fall prevention education for various professionals, support research, program development and program evaluation related to falls, and (in the federal bill) a national public education campaign. Both bills were signed into law without appropriations, suggesting that the ICCC goal of promoting consistent financing for fall-related efforts has yet to be achieved in the US. Nonetheless, these legislative efforts suggest that the problem of falls is visible within the policy realm and continued advocacy efforts are critical.

CHALLENGES AND SOLUTIONS TO IMPROVING IMPLEMENTATION OF EVIDENCE-BASED FP/M STRATEGIES

The first challenge facing those who want to implement successful FP/M strategies is diffusing knowledge of the FP/M evidence base. Evidence supporting FP/M provides a basic understanding of the kinds of activities that decrease fall risk,⁶ but this knowledge may not have fully diffused into community settings. Perhaps for this reason, there is a remarkable diversity of ways in which fall prevention activities are delivered, with overlapping services in some areas and lack of availability of services in others.

The second challenge facing champions of FP/M is that providing FP/M involves multiple health and social services. FP/M’s complexity consists of different terminology, operations, administration, financing, and reimbursements across settings,⁴⁸ justifying the comment that US health and social care delivery systems are a “nightmare to navigate.”⁴⁹ Therefore, even successful linkages between FP/M activities, especially those linking medical care and

social care, are inherently fragile. Recent studies of health care systems implementing ICCC principles on complex health problems (e.g., diabetes) suggest that the connection to community resources was generally the weakest link.⁵⁰⁻⁵² Even if a case manager is assigned to an older adult with the sole responsibility to provide to care coordination (assessment, treatment planning, implementation, monitoring, and evaluation involving older adults, caregivers, and professional providers),⁵³ a breakdown at any point of the care coordination process can leave older adults and their caregivers without needed FP/M supports.

In this article, we have attempted to respond to the challenge of diffusing knowledge by synthesizing and describing the FP/M evidence base for a broad readership. To address mechanisms that can better coordinate FP/M activities, we now describe an application of the ICCC model through a “no wrong door” approach to FP/M (Figure 2). In this approach, older adults assessed as at risk for falls in one of the three areas (e.g., medical management) should receive at least a minimal evaluation in the other two areas (physical activity and home safety) regardless of where older adults enter a system of care involved in FP/M. In many cases, there are various professionals who can perform these activities, regardless of formal role. Ideally, engagement with a particular provider who becomes concerned about fall risk (e.g., a senior center physical activity instructor) would trigger linkages to an initial assessment in one particular area (e.g., physical activity/fall risk assessment), followed by referrals to the appropriate complementary providers (e.g., physician, occupational therapist) to complete the other necessary activities (e.g., medical risk assessment, home safety assessment). Trained providers completing various risk assessments would then connect older adults and caregivers directly to programs and services to address the identified risk in the most appropriate manner.

The success of a “no wrong door” approach depends heavily on changes at the consumer and provider levels. First, older adults need to be willing to participate in risk assessments and make suggested changes. Second, providers need to 1) be aware of FP/M assessment and intervention processes available within and outside their organization, 2) connect older adults to these programs in the health care *and* community service sectors by giving program information to older adults and/or caregivers and making referrals through intra-and inter-organizational channels, and 3) follow up to ensure that older adults in need are actually linked with the intended services. Follow up, in particular, is very important because fall risk assessments that are not tightly linked to appropriate interventions will not prevent falls, as suggested by a recent meta-analysis.⁹ Effective follow-up also depends on information systems that support each provider with the necessary information from other providers about an older adult’s fall risk just when key information is needed.⁵⁴ Building an information system architecture that supports providers requires far more than technology – it requires thoughtful design of the information system in terms of content, integration with providers’ work routines, security, and delineation of responsibilities among providers.

Several organization and policy-level factors are also necessary to increase access and utilization of FP/M services including developing and enhancing program capacity built upon evidence-based models; training staff in appropriate risk assessments and interventions for a particular setting; educating older adults, caregivers, and various health and social care providers on FP/M activities; exploring reimbursement streams to ensure sustainability and cost-effectiveness of FP/M programs; and harnessing the power of collaborative partnerships to achieve these goals. Similar to implementing other evidence-based practices,⁵⁵ contextual issues such as staffing ratios, face-to-face time with older adults, organizational resources and culture, leadership styles, and internal evaluation processes can greatly promote or hinder linkage and care coordination processes. Specific policy-level solutions to increase the use of FP/M activities in the US include instituting Medicare

coverage for FP/M assessments,¹⁶ expanding the role of Medicare managed care plans in offering exercise classes as part of their benefit packages,⁵⁶ and providing tax credits for adults of all ages who make home modifications to support safe aging in place.

CONCLUSIONS

For chronic health conditions that particularly affect older adults, evidence to support FP/M efforts is among the strongest. Adopting this evidence routinely, however, requires appropriate implementation and sustainability strategies that involve multiple providers collaborating with older adults and caregivers. Practitioners, policy-makers, and researchers could improve awareness and diffusion of FP/M activities by inventorying the local landscape of fall prevention champions, services and policies, and then evaluating to what extent ICCC and “no wrong door” principles are used in standard practice. Once practitioners identify quality gaps in current fall prevention activities, they can determine the causes of these gaps, implement an improvement program targeting a particular quality gap, and then evaluate the improvement program to see if it has improved the quality of care and generated better outcomes for older adults.⁵⁷ It takes a village of stakeholders working together to prevent falls and reduce fall risk, tasks that no one stakeholder can accomplish alone. In that spirit, we hope that readers will write responses to this article with information about additional innovative programs and policies to support fall prevention activities throughout the world.

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Positive Policy Environment

- Strengthen partnerships
- Support legislative frameworks
- Integrate policies
- Provide leadership and advocacy
- Promote consistent financing
- Develop and allocate human resources

Links

Community

- Raise awareness and reduce stigma
- Encourage better outcomes through leadership and support
- Mobilize and coordinate resources
- Provide complementary services

Health Care Organization

- Promote continuity and coordination
- Encourage quality through leadership and incentives
- Organize and equip health care teams
- Use information systems
- Support self-management and prevention

Community Partners

Health Care Team

Informed

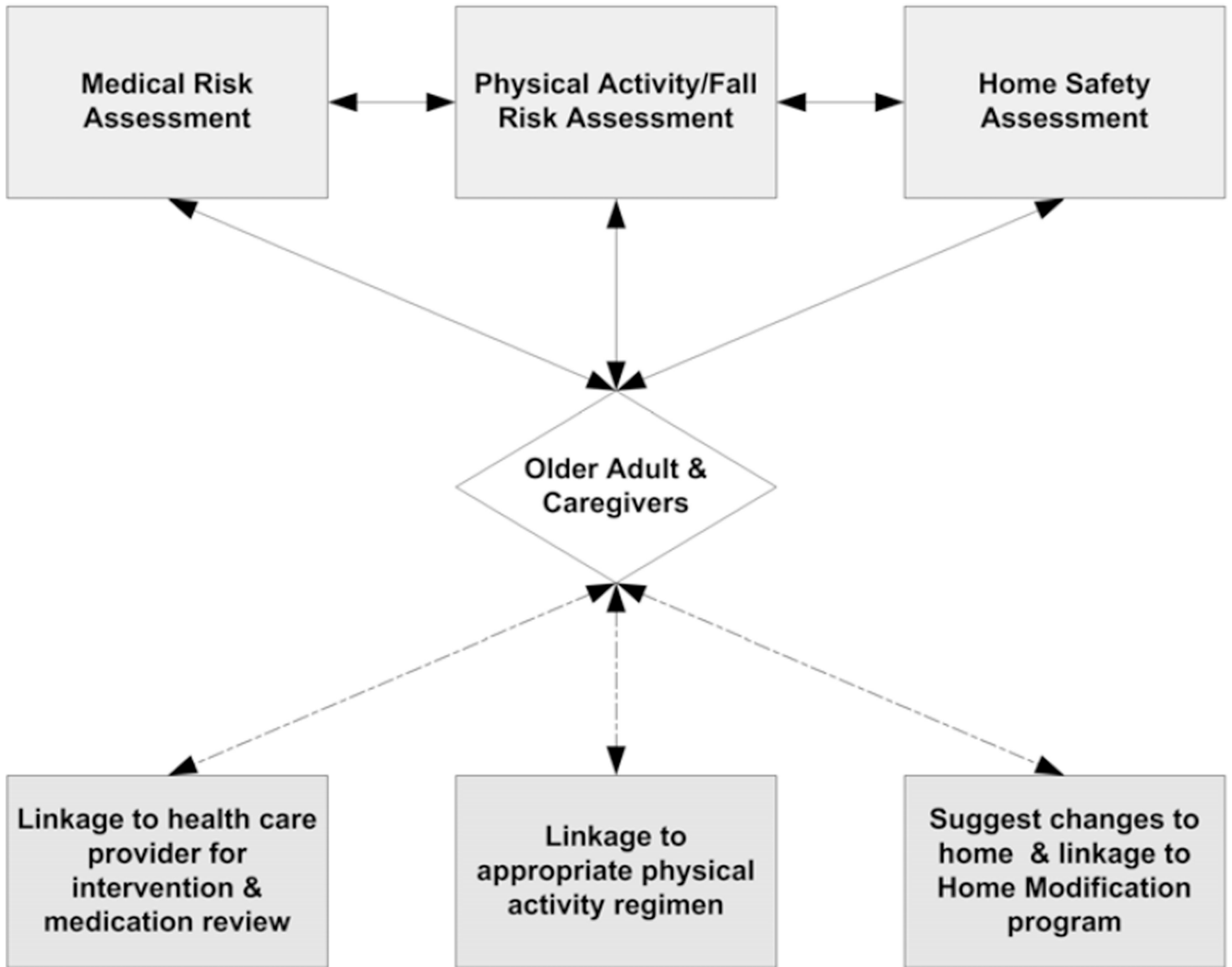
Motivated

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Patients and Families

Better Outcomes for Chronic Conditions

Figure 1. The Innovative Care for Chronic Conditions Framework
Image reprinted with permission of the World Health Organization.



Legend:

Solid lines - Multifactorial risk assessment regardless of where older adult enters fall prevention/management system of care

Broken lines - Possible referral pathways based on assessment outcomes

Figure 2. “No Wrong Door” approach to fall prevention and management

Adapted from: Alkema, G. E. *Technical Assistance Brief #2: Integrating Fall Prevention Components in Existing Organizational Structures*. Los Angeles, CA: Fall Prevention Center of Excellence; 2006.