



Ontario Neurotrauma Foundation  
Fondation ontarienne de neurotraumatologie



# **Towards an Integrated, Systems-Based Approach to Fall Prevention in Ontario: An Environmental Scan of Current Interventions and Recommendations for Action**

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## Contents

<b>1. Introduction and Purpose of Document.....</b>	<b>3</b>
<b>2. Methodology.....</b>	<b>5</b>
<b>3. An Overview of Fall Prevention Initiatives in Ontario.....</b>	<b>7</b>
3.1 Local Health Integration Networks.....	7
3.2 Public Health Units .....	9
<b>4. Key Trends and Issues in Fall Prevention.....</b>	<b>12</b>
4.1 Components of Effective Fall Prevention Interventions:.....	12
What does the evidence tell us? .....	12
4.2 New Findings and Innovations in Fall Prevention Interventions .....	19
4.3 Key Factors Influencing the Impact of Fall Prevention Interventions.....	23
<b>5. Towards an Integrated, Systems-Based Approach to Fall Prevention in Ontario...27</b>	
5.1 Definitions and Rationale .....	27
5.2 Perceived Degree of Integration of Fall Prevention Initiatives in Ontario .....	31
5.3 Potential Models for Achieving a More integrated approach to Fall Prevention	33
5.4 Recommendations for Creating a More Integrated, Systems-Based Approach to Fall Prevention in Ontario .....	35
<b>6. Summary and Conclusion .....</b>	<b>38</b>
<b>References.....</b>	<b>39</b>

## 1. Introduction and Purpose of Document

The impact of falls among older adults (age 65+) can be traumatic, resulting in injuries, decreased mobility, loss of independence and death (Public Health Agency of Canada, 2014; Stevens and Lee, 2018). Falls are the leading cause of hospitalization among Canadian seniors, with an estimated 20 to 30 percent of seniors falling each year (Public Health Agency of Canada, 2014). In addition to the negative health impacts of falling, there are considerable associated financial costs: in 2010, Ontario spent a total of \$2.8 billion addressing fall-related injuries (Parachute, 2015).

Falls among older adults occur for a variety of reasons ranging from biological and behavioural risk factors to environmental and socio-economic risk conditions. Given the broad range of factors contributing to falls, comprehensive multi-strategy interventions addressing both the intrinsic (individual) and extrinsic (socio-environmental) causes of falls are emerging as the most effective approaches to reducing fall-related injuries and deaths among older adults (Tricco et al., 2017; Guirguis-Blake et al, 2018; Hopewell et al., 2018).

In Ontario, fall prevention initiatives for older adults, vary in their scope, approach to planning, implementation and measurement of outcomes (Ontario Fall Prevention Collaborative, 2018). Accordingly, the heterogeneous, fragmented nature of fall prevention efforts makes it difficult to ascertain what interventions are working, how interventions can be improved and where a greater investment of resources or an increased level of coordination and collaboration between key stakeholders is required to maximize impact.

To address this challenge, a small group of individuals representing key organizations involved in fall prevention initiatives, including Local Health Integration Networks (LHINs), provincial rehabilitation alliances and networks, public health units, and health care institutions, were brought together by the Ontario Neurotrauma Foundation (ONF) to develop the proposed concept and structure of an Ontario Fall Prevention Collaborative. The intended purpose of the Collaborative is to promote and advocate for a more integrated, systems-based approach to preventing falls among older adults in Ontario (Ontario Fall Prevention Collaborative, 2018).

An initial meeting of key stakeholders to discuss the potential mandate and priorities of an Ontario Fall Prevention Collaborative is scheduled to take place on November 28, 2018. The expected outcomes of this meeting are: a clear commitment to support and participate in the development of:

- a) a system-based approach to fall prevention in older adults,
- b) a common agenda for fall prevention across the continuum of care

An environmental scan of fall prevention initiatives and related issues was commissioned by ONF to serve as a background resource for this meeting. The results of the scan are presented in the following document. Specifically, the scan provides:

- an inventory of current, evidence-based fall prevention programs/resources in Ontario that could guide the development of future initiatives or potentially be 'scaled-up' for province-wide adoption;
- an overview of evidence-based fall prevention programs/resources in other jurisdictions (i.e., outside Ontario) that could guide the development of future initiatives or potentially be 'scaled-up' for province-wide adoption;
- a description of enabling factors and challenges associated with the strategic integration of fall prevention initiatives in the broader health care system (i.e., a systems approach to fall prevention);
- recommendations and suggested next steps to foster the development of a systems-based approach to planning and implementing fall prevention initiatives in Ontario.

## 2. Methodology

The information presented in this scan was derived from two key sources. First, studies, systematic reviews and meta-analyses on evidence-based fall prevention initiatives were obtained from a series of searches utilizing the following databases:

- **PubMed/Medline** (using medical subject MeSH headings);
- **CINAHL** (nursing literature database);
- **Scopus** ('all fields' search);
- **Cochrane library** (title, abstract, keyword search);
- **Campbell library** (title, abstract, keyword search);
- **Eric** (health education database);
- **Google/Google Scholar** (for government, NGO documents plus 'grey literature').

The date range for all research database searches was January 2011-September 2018. Searches were conducted using the following keywords in combination with the Boolean string 'and':

- fall, falls
- prevention, preventive, primary prevention, secondary prevention
- seniors, elderly, older adults, healthy, active, frail, cognitive impairment, dementia
- program, intervention, initiative, strategy, organization, policy, clinical coordinated, systems, systems-based, integrated, collaboration, partnership.

The second key source of information for the environmental scan was a series of key informant interviews conducted with fifteen respondents who are: a) directly involved in the planning and implementation of fall prevention initiatives in Ontario or b) actively involved in research on effective components of integrated, systems-based approaches to health service planning and delivery. Specifically, the respondents, who were identified by the Ontario Fall Prevention Collaborative Working Group, included representatives from the following organizations/sectors:

- Local Health Integration Networks (LHINs) who are involved in the planning, coordination, implementation and evaluation of initiatives to prevent falls among older adults (N=4);
- Public health units involved in the planning, coordination, implementation and evaluation of primary prevention initiatives to prevent falls among older adults (N=2);
- Health Care Institutions (e.g., Specialized Geriatric Centres) offering comprehensive assessments of adults who have fallen (or are at risk of falling) and fall prevention interventions (N=4);
- Health Shared Services Ontario, an agency of the Government of Ontario that supports Ontario's LHINs in meeting the health care needs of their local communities (N=1);
- University or hospital-based researchers focusing on effective models of integrated, system based health services (N=4).

Semi-structured interviews of approximately 30-45 minutes duration were conducted for all respondents. Questions addressed topics related to: the nature and scope of current fall prevention interventions (if applicable), including related collaboration and evaluation activities; perceptions of the terms 'integration' and 'system-based' in the context of fall prevention work; perceived level of integration of fall prevention interventions with complementary prevention and clinical services in the catchment area served by the respondent's organization (if applicable); perceived barriers to the implementation of more integrated, systems-based fall prevention initiatives and solutions for overcoming these barriers. With the consent of the respondents, the interviews were digitally recorded and full transcripts of each recording were prepared for analysis.

### 3. An Overview of Fall Prevention Initiatives in Ontario

The following section is meant to give the reader a better sense of the range of work conducted by key organizations in Ontario with a fall prevention mandate, including LHINs, public health units and health care institutions (e.g., regional geriatric centres). It is not meant to serve as a comprehensive inventory of all fall prevention initiatives in the province; rather, it provides a sample of key fall prevention activities conducted by organizations identified by the Ontario Fall Prevention Collaborative Working Group as taking a more comprehensive, multi-faceted approach to addressing the problem of falls in older adults.

#### 3.1 Local Health Integration Networks

Created in 2007, Ontario's fourteen local health integration networks (LHINs) are mandated with planning, integrating, and distributing provincial funding for all public healthcare services at a regional level (Ontario Ministry of Health and Long-Term Care, 2018a). In September 2010, fall prevention was identified as a key pan-LHIN priority at a quarterly meeting held by the Ministry of Health and Long-Term Care and the LHINs. Follow up actions arising from this meeting included the development of an Integrated Falls Prevention Framework and Toolkit (Local Health Integration Network Collaborative, 2011) and a recommendation that effective, LHIN-wide Integrated Falls Prevention Programs be established in each LHIN. Key LHIN-led fall prevention initiatives launched in the wake of the Framework include, but are not limited to, the following:

##### ***North East LHIN***

Originally developed in Queensland, Australia, Stay on Your Feet (SOYF) is a fall prevention program for older adults living in the community (Peel, Bell and Smith, 2008). SOYF was adapted by the North East LHIN, which provided the five public health units in its catchment area with dedicated funding to implement SOYF region-wide in 2014. As a condition of this funding, each health unit is required to have a minimum of one FTE dedicated to SOYF. Local SOYF coalitions have been established by each of the participating health units.

While the nature and scope of SOYF programming varies somewhat depending on community needs, standard components of the intervention include:

- free exercise classes, including Stand Up! fall prevention classes;
- referral of older adults at risk of falling to appropriate services;
- developing community-level partnerships to encourage fall prevention initiatives across key sectors and settings, including hospitals, residential aged care and the community;
- non-clinical focused awareness training and professional development for people who work to prevent falls among older adults.

At present, SOYF is assessed through a combination of process evaluation measures and high-level common indicators. North East LHIN is currently reviewing ways of making the SOYF evaluation more rigorous and outcome-focused.

## **Mississauga-Halton LHIN**

Key fall prevention initiatives administered by the Mississauga-Halton LHIN include:

- fall prevention exercise classes offered throughout the LHIN catchment area by funded providers (e.g., Lifemark Seniors Wellness);
- hospital-based fall prevention clinics that provide clients with a comprehensive assessment and develop an appropriate program for them based on their needs/risk factors;
- dedicated funding to long-term care homes for investments in fall prevention equipment (e.g., mats, grab bars).

In 2016, the LHIN established an Exercise and Fall Prevention Collaborative comprised of public and private sector service providers. The Collaborative recently developed an exercise and fall prevention strategy and framework to ensure a more coordinated approach to reducing the rate of falls in Mississauga-Halton LHIN.

At present, evaluation of the LHIN's fall prevention initiatives consists of performance indicators tied to funding, which are reported to the LHIN by funded organizations on a quarterly basis. These indicators include client demographics as well as improvements in test scores, such as walking tests following physiotherapy.

## **Champlain LHIN**

Like other LHINs, Champlain LHIN acted on the 2011 Integrated Fall Prevention Strategy and Toolkit by establishing a Champlain Falls Prevention Steering Committee, in collaboration with hospitals, primary care, community support services, public health units, and the Regional Geriatric Program of Eastern Ontario (a coordinated network of specialized geriatric services). This committee developed a comprehensive strategy also based on the Stay on Your Feet framework, to reduce the frequency, severity and impact of falls among older adults living in the region. Champlain LHIN supports the strategy through funding providers to deliver a range of community-based fall prevention programs, exercise classes and physiotherapy services throughout the region. A system wide approach to ensuring common standards of delivery across the region has been taken, using standard tools across all sectors and stages of the senior's journey of risk, such as processes in Ambulatory and Emergency departments, standards of training for exercise class instructors and content for Fall Prevention classes.

A key component of Champlain's fall prevention strategy involved the creation of an algorithm for community and primary care practitioners that would a) promote system-wide health promotion and intervention and b) determine the root causes of falls and facilitate appropriate levels of intervention (stopfalls.ca, 2018). The algorithm and related checklists, which were based partially on the 2010 American Geriatric and British Geriatric Clinical Practice guidelines, are available on the stopfalls.ca website. An education module for physicians and other health care professionals has been developed and accredited through the University of Ottawa. This is also available on [www.stopfalls.ca](http://www.stopfalls.ca) along with a module for PSWs and other tools to support the delivery of the Champlain Stay on Your Feet strategy.

Evaluation of Champlain’s fall prevention measures consists of a mix of tracking measures (e.g, attendance at exercise classes) and more rigorous evaluations of specific programs conducted by providers. The LHIN has also attempted to assess the cost benefit of its fall prevention work.

### ***Erie-St Clair LHIN***

Erie-St. Clair LHIN funds a range of service providers to implement fall prevention activities. Key initiatives include:

- home safety assessments conducted by occupational therapists working at community health centres in the LHIN’s catchment area;
- Seniors Maintaining Active Roles Together (SMART) exercise classes offered by the Victorian Order of Nurses at rest and retirement homes;
- subsidised bathroom grab bars for low-income seniors;
- a mobile fall clinic model (currently under review) that provided increased access to screening and assessment for seniors.

The LHIN recently (July 2018) surveyed key fall prevention stakeholders, including retirement homes, hospitals and long-term care homes, to help guide a more integrated, collaborative approach to fall prevention planning going forward. Evaluation of LHIN-supported fall prevention activities primarily consist of process measures (e.g., number of clients seen) submitted by funded providers.

## **3.2 Public Health Units**

Ontario’s 35 public health units are mandated to undertake fall prevention programming through the Injury Prevention Guideline of the 2018 Ontario Public Health Standards, which identifies “falls” as one of the topics to be addressed based on an assessment of local needs (Ontario Ministry of Health and Long Term Care, 2018b). In addition, public health units were identified as a key partner in the implementation of the 2011 Integrated Provincial Falls Prevention Framework (LHIN Collaborative, 2011).

Public health units play an active role in the various LHIN-established fall prevention committees and coalitions. In some areas, health units established inter-sectoral fall prevention networks and coalitions that preceded the LHINs.

The nature of fall prevention activities conducted by health units varies considerably across the province, but generally includes exercise classes implemented in collaboration with a range of partner organizations, health education and awareness raising events for older adults, care givers and service providers. Through their websites, many health units also maintain lists of fall prevention supports and resources available in their communities.

The level of staff and resources dedicated to fall prevention within health units varies considerably across the province, with some health units having dedicated fall prevention teams in place while others only have a single staff person. This may, in part, be due to the Ontario Public Health Standards directive that falls be addressed in accordance with community needs, or it may reflect divergent views about the importance of fall prevention within health units.

## Regional Geriatric Centres and Programs

The network of regional geriatric centres and programs across the province offer a more individualized approach to fall prevention that entails the development of support plans based on the results of a comprehensive geriatric assessment. These assessments, which are provided to older adults referred to the geriatric centres/programs, address a range of risk factors and conditions including cognitive impairment, functional decline, mobility, medication use and home safety. These assessments are conducted by multi-disciplinary teams comprised of registered nurses, nurse practitioners, physicians, social workers and occupational therapists.

Geriatric centres also offer fall prevention exercise programs. However, they are not available to the general public and admission is contingent upon a comprehensive falls assessment. One of the more well documented examples noted by respondents is the Frail to Fit, a twelve week (2 sessions per week) exercise program offered to eligible older adults by the North East Specialized Geriatric Centre. Participants perform supervised exercises that focus on strength building, endurance and balance improvement. These exercise sessions are offered in tandem with educational sessions focused on improving home safety and home visits by occupational therapists to identify risks for falls and provide recommendations. A discharge summary is sent to the referring physician/nurse practitioner at the end of the program.

One of the challenges identified through evaluations of Frail to Fit is the tendency of participants to regress to baseline levels of physical activity upon completion of the program. This was revealed through 3 and 6 month follow up assessments. To rectify this problem, the North East Specialized Geriatric Centre is in the process of developing a new exercise program aimed at sustaining physical activity among clients who have completed Frail to Fit but are not physically robust enough to take part in community-based exercise programs for seniors.

## 4. Key Trends and Issues in Fall Prevention

### 4.1 Components of Effective Fall Prevention Interventions:

#### What does the evidence tell us?

A broad range of interventions for preventing falls among older adults have been implemented and evaluated. These most commonly address known modifiable risk factors for falling (e.g., muscle weakness, multiple medication use), and some specifically target individuals with a history of falls or a high risk of falling (Lamb et al, 2011; Gillespie et al., 2012).

Fall prevention interventions may comprise single component interventions, such as balance training. Or they may entail a combination of two or more complementary interventions, such as balance training, strength and resistance exercises (Hopewell et al., 2018). Fall prevention interventions with more than one primary component or activity can be classified into one of two groups: **multifactorial interventions** where the interventions are tailored to an individual assessment of risk, and **multiple component interventions** where the same combination of interventions is provided to all participants (Lamb et al., 2011).

Multifactorial and multiple component interventions are generally thought to be more effective in preventing falls among community dwelling older adults given their capacity to address multiple individual risk factors and socio-environmental risk conditions (Gillespie, 2012). An assessment of the most effective combination of interventions for preventing falls among older adults was the focus of three systematic reviews conducted over the past year:

- a systematic review of interventions to prevent falls in community dwelling older adults (Guirguis-Blake et al., 2018), which guided the most recent recommendations for preventing falls by the US Preventive Services Task Force (Grossman et al., 2018);
- a Cochrane Collaboration systematic review of multifactorial and multiple component interventions for preventing falls among older people living in the community (Hopewell et al, 2018); and
- a systematic review and meta-analysis of interventions for preventing falls among older adults (Tricco et al., 2017).

Table 1 (see next page) summarizes the methodology employed by each of the reviews, including data sources, study selection, and critical appraisal methods. The final column of the table provides a high-level summary of the key findings obtained by each of the reviews.

**Table 1: Key Elements of Systematic Reviews for Fall Prevention Interventions (2017-18)**

Citation	Data Sources	Study Selection	Appraisal Methods	Key Findings
<p>Guirgus-Blake, JM, Michael, YL, Perdue, LA et al (2018) <b>Interventions to Prevent Falls in Community-Dwelling Older Adults: A Systematic Review for the US Preventive Services Task Force. Evidence Synthesis No. 159.</b> Rockville, MD: Agency for Healthcare Research and Quality.</p>	<p>MEDLINE, PubMed, CINAHL and Cochrane Register of Controlled Trials searched for literature published b/w Jan 2010 and Aug 2016 plus re-evaluation of all studies in earlier 2010 review.</p> <p>Supplementation with reference lists from other systematic reviews, expert suggestions and ClinicalTrials.gov</p>	<p>62 trials (N=35,508) examining seven types of multi-factorial, single or multiple interventions aimed at reducing falls, people experiencing a fall and/or fall-related injuries in high risk older adults.</p> <p>Largest body of literature in review evaluated multifactorial interventions (26 trials) and exercise interventions (21 trials)</p>	<p>Two investigators conducted independent assessments of study quality using methods developed by the US Preventive Services Task Force (USPSTF)</p> <p>Data qualitatively synthesized for each key question, and trial results meta-analyzed when appropriate.</p>	<p>Fall-related benefit associated with both multi-factorial and exercise interventions, but evidence most consistent across fall-related outcomes for exercise trials.</p> <p>Investigators unable to reach firm conclusions about other fall prevention interventions due to insufficient data or mixed results.</p>
<p>Hopewell, S., Adedire, O, Copsey, BJ et al (2018) <b>Multifactorial and multiple component interventions for preventing falls in older people living in the community.</b> Cochrane Database of Systematic Reviews Issue 7. Act. No: CD012221. doi: 10.1001/jama.2017.15006.</p>	<p>Cochrane Bone Joint and Muscle Trauma Group Specialized Register, Cochrane Register of Controlled Trials, MEDLINE, Embase, CINAHL, trial registers and reference lists for literature published b/w Jan 2012 and June 2017.</p>	<p>62 trials (N = 19,935) evaluating the effects of multi-factorial and multiple component interventions on falls among older people living in the community compared with control (i.e., no change in usual activities) or attention control (social visits) or exercise as a single intervention.</p>	<p>Two reviewers conducted independent selection of studies, assessments of bias risks and data extraction.</p> <p>Rate ratio with 99% confidence intervals calculated for rate of falls. Risk ratios with 95% confidence interval calculated for dichotomous outcomes.</p> <p>Random effects model used to pool data, and GRADE approach used to assess quality of evidence</p>	<p>Multifactorial interventions may reduce the rate of falls among older people compared with those receiving usual care or attention control, but there may be little or no difference in other falls-related outcomes, with the possible exception of interventions reducing the risk of fall-related fractures.</p> <p>Multi-component interventions where exercise is a key component probably reduce the rate and recurrence of falls and may slightly improve quality of life. There was insufficient evidence to determine the effects on fall-related fractures or hospital admissions</p>
<p>Tricco, AC, Thomas, SM, Veroniki, AA et al (2017) "Comparisons of Interventions for Preventing Falls in Older Adults: A Systematic Review and Meta-analysis." <b>Journal of the American Medical Association 318</b> (17), 1687-1699. doi: 10.1001/jama.2017.15006.</p>	<p>MEDLINE, Embase, Cochrane Register of Controlled Trials and Ageline databases searched from inception to April 2017</p>	<p>283 trials of fall prevention interventions for participants aged 65 and older (N = 159,910).</p> <p>54/283 trials (N=41,596) selected for network meta-analysis</p>	<p>Pairs of reviewers independently screened studies, abstracted data and appraised risk of bias</p> <p>Cochrane Effective Practice and Organization of Care Group's Risk of Bias Tool used to appraise included studies</p> <p>Pairwise and network meta analyses</p>	<p>Network meta-analysis suggested the following interventions (when compared with usual care) were associated with reductions in injurious falls: exercise; combined exercise and vision assessment and treatment; combined exercise and vision assessment and treatment and environmental assessment and modification; combined</p>

			conducted for selected outcomes	clinic-level quality improvement strategies, multi-factorial assessment/treatment, calcium and Vitamin D supplementation
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All three reviews found that exercise programs, when delivered as a stand-alone intervention or in combination with other interventions, were associated with lower rates of injurious falls (Guirguis-Blake, 2018; Hopewell et al., 2018; Tricco et al., 2017). The systematic review and meta-analysis conducted by Tricco et al (2017), which encompassed a larger number of randomized control trials than the two corresponding reviews and conducted pairwise meta-analyses on key combinations of interventions, found that intervention combinations, including exercise, vision assessment and treatment, environmental assessment and modification, multifactorial assessment (i.e., risk assessment, screening) and treatment, and vitamin D supplementation were associated with the prevention of injurious falls. The combination of exercise and vision assessment and treatment was identified as the combination of interventions most strongly associated with the reduction of injurious falls (Tricco et al, 2017). The association between vitamin D supplementation and fall prevention noted by Trico et al stands in contrast with the latest recommendation statement on interventions to prevent falls developed by the US Preventive Services Task Force (USPSTF). The USPSTF, which was guided by the systematic review conducted by Guirguis-Blake et al (2018), recommended against vitamin D supplementation as a means of preventing falls in community dwelling adults aged 65 and older (Grossman et al., 2018).

The other two systematic reviews, by contrast, took a more qualified stance on the efficacy of multi-factorial and multi-component interventions. Guirguis-Blake et al (2018) concluded that a positive fall-related benefit was associated with both multi-factorial and exercise interventions, but the findings were most consistent across fall-related outcomes for exercise trials. Multi-factorial interventions, encompassing risk-based customized referrals and treatments, were associated with a 21 percent reduction in falls but no statistically significant effect on people experiencing a fall. The investigators were unable to reach conclusions about the efficacy of other fall prevention strategies due to data limitations, including significant heterogeneity in the design and implementation of intervention types which prohibited comparison. The Cochrane review conducted by Hopewell et al (2018) found that while multi-factorial interventions may reduce the risk of falls among older people compared with usual care (i.e., status quo) or attention control (e.g., home visits), there was little or no difference in other falls-related outcomes. Multiple component interventions where exercise was a key

intervention was associated with a probable decrease in falls and a slight improvement in quality of life.

A more detailed set of practice guidelines emerged from a review of the effectiveness of falls prevention interventions undertaken by the Registered Nurses Association of Ontario (RNAO) in the spring of 2016 (RNAO 2017). To update previously developed guidelines on fall prevention (RNAO, 2005, 2011), The RNAO convened an interprofessional panel to review the purpose and scope of the guidelines, determine inclusion and exclusion criteria and confirm research questions for a systematic review conducted by RNAO research associates who used the AMSTAR (A Measurement Tool to Assess Systematic Reviews) critical appraisal tool to assess the retrieved literature. Using an adapted version of an evidence hierarchy developed by the Scottish Intercollegiate Guidelines Network (SIGN, 2011, Pati, 2011), the RNAO review utilized the following five point scale (see Table 2) ranging from “evidence supported by a meta-analysis or systematic reviews...” (level 1a) to “evidence obtained from expert opinion or committee reports....” (level 5 to each of its recommended practices):

**Table 2: Levels of Evidence Supporting RNAO Best Practice Guidelines for Preventing Falls (RNAO, 2017, p. 9)**

Level	Source of Evidence
1a	Evidence obtained from meta-analysis or systematic reviews of randomized controlled trials, and/or synthesis of multiple studies primarily of quantitative research.
1b	Evidence obtained from at least one randomized controlled trial.
IIa	Evidence obtained from at least one well-designed controlled study without randomization.
IIIb	Evidence obtained from at least one other type of well-designed quasi-experimental study, without randomization.
III	Synthesis of multiple studies primarily of qualitative research.
IV	Evidence obtained from well-designed non-experimental observational studies, such as analytical studies or descriptive studies, and/or qualitative studies.
V	Evidence obtained from expert opinion or committee reports, and/or clinical experiences of respected authorities.

The recommendations arising from the RNAO review of practice guidelines and corresponding levels of evidence (see Table 2 above) are summarized in the following table (see next page).

**Table 3: Summary of RNAO Recommendations for Preventing Falls and Reducing Injuries from Falls (RNAO, 2017, pp. 11-14)**

Practice Recommendation	Level of Evidence
<p><b>Recommendation 1.1:</b> Screen all adults to identify those at risk for falls. Conduct screening as part of admission processes, after any significant change in health status, or at least annually. Screening should include the following approaches:</p> <ul style="list-style-type: none"> <li>• identifying a history of previous falls;</li> <li>• identifying gait, balance, and/or mobility difficulties; and</li> <li>• using clinical judgment.</li> </ul>	1a and V
<p><b>Recommendation 1.2a:</b> For adults at risk for falls, conduct a comprehensive assessment to identify factors contributing to risk and determine appropriate interventions. Use an approach and/or validated tool appropriate to the person and the health-care setting</p>	III
<p><b>Recommendation 1.2b:</b> Refer adults with recurrent falls, multiple risk factors, or complex needs to the appropriate clinician(s) or to the interprofessional team for further assessment and to identify appropriate interventions.</p>	V
<p><b>Recommendation 2.1:</b> Engage adults at risk for falls and fall injuries using the following actions:</p> <ul style="list-style-type: none"> <li>• explore their knowledge and perceptions of risk, and their level of motivation to address risk;</li> <li>• communicate sensitively about risk and use positive messaging;</li> <li>• discuss options for interventions and support self-management;</li> <li>• develop an individualized plan of care in collaboration with the person;</li> <li>• engage family (as appropriate) and promote social support for interventions; and</li> <li>• evaluate the plan of care together with the person (and family) and revise as needed.</li> </ul>	1a, III and V
<p><b>Recommendation 2.2:</b> Provide education to the person at risk for falls and fall injuries and their family (as appropriate) in conjunction with other falls prevention interventions. This includes providing information about risk for falls, falls prevention, and interventions. Ensure that the information is provided in a variety of formats and in the appropriate language.</p>	1a and V
<p><b>Recommendation 2.3:</b> Communicate the person’s risk for falls and related plan of care/interventions to the next responsible health-care provider and/or the interprofessional team at all care transitions to ensure continuity of care and to prevent falls or fall injuries.</p>	V
<p><b>Recommendation 2.4:</b> Implement a combination of interventions tailored to the person and the health-care setting to prevent falls or fall injuries.</p>	1a
<p><b>Recommendation 2.5:</b> Recommend exercise interventions and physical training for adults at risk for falls to improve their strength and balance. Encourage an individualized, multicomponent program/ activity that corresponds to the person’s current abilities and functioning.</p>	1a
<p><b>Recommendation 2.6:</b> Collaborate with prescribers and the person at risk for falls to reduce, gradually withdraw, or discontinue medications that are associated with falling, when the person’s health condition or change in status allows. This includes the following actions:</p> <ul style="list-style-type: none"> <li>• identify polypharmacy and medications that increase risk for falls;</li> <li>• conduct a medication review, or refer to an appropriate health-care provider and/or the prescriber; and</li> <li>• monitor for side effects of medications known to contribute to risk for falls.</li> </ul>	1a and V
<p><b>Recommendation 2.7:</b> Refer adults at risk for falls or fall injuries to the appropriate health-care provider for advice about vitamin D supplementation.</p>	V
<p><b>Recommendation 2.8:</b> Encourage dietary interventions and other strategies to optimize bone health in adults at risk for falls or fall injuries, particularly those at risk for fracture. Refer to the appropriate health-care provider for advice and individualized interventions.</p>	V

<b>Recommendation 2.9:</b> Consider hip protectors as an intervention to reduce the risk of hip fracture among adults at risk for falls and hip fracture. Review the evidence, potential benefits, harms, and barriers to use with the person to support individualized decisions.	1a
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**Table 3: Summary of RNAO Recommendations for Preventing Falls and Reducing Injuries from Falls Continued (RNAO, 2017, pp. 11-14)**

Practice Recommendation	Level of Evidence
<p><b>Recommendation 3.1:</b> After a person falls, provide the following interventions:</p> <ul style="list-style-type: none"> <li>• conduct a physical examination to assess for injury and to determine the severity of any fall injuries;</li> <li>• provide appropriate treatment and care;</li> <li>• monitor for injuries that may not be immediately apparent;</li> <li>• conduct a post-fall assessment to determine factors that contributed to the fall;</li> <li>• collaborate with the person and the interprofessional team to conduct further assessments and determine appropriate interventions; and</li> <li>• refer the person to the appropriate health-care provider(s) for physical rehabilitation and/or to support psychological well-being (as needed).</li> </ul>	III and V
<p><b>Recommendation 4.1:</b> Educational institutions incorporate content on falls prevention and injury reduction into health-care education and training programs.</p>	V
<p><b>Recommendation 4.2:</b> Health-care organizations provide ongoing organization-wide education to all staff in conjunction with other activities to help prevent falls and reduce injuries among persons in their care.</p>	1a
<p><b>Recommendation 5.1:</b> To ensure a safe environment:</p> <ul style="list-style-type: none"> <li>• implement universal falls precautions, and</li> <li>• identify and modify equipment and other factors in the physical/structural environment that contribute to risk for falls and fall injuries.</li> </ul>	1a
<p><b>Recommendation 5.2:</b> Organizational leaders, in collaboration with teams, apply implementation science strategies to enable successful implementation and sustainability of falls prevention/injury reduction initiatives. This includes identifying barriers and establishing formalized supports and structures within the organization.</p>	1a
<p><b>Recommendation 5.3:</b> Implement rounding as a strategy to proactively meet the person’s needs and prevent falls.</p>	1a

## 4.2 New Findings and Innovations in Fall Prevention Interventions

Recent years have witnessed the emergence of a range of novel fall prevention interventions that - given their nascent stage of development and uptake - may be omitted or under-represented in systematic reviews of best practices. The following section summarizes new assessment techniques and interventions with the potential to prevent falls in older adults.

### ***Sensing Technology***

Wearable sensors typically contain triaxial accelerometer, gyroscope and pressure sensor, and can be attached to various body parts (e.g, waist, wrist or ankle) or worn as a pendant (Howcraft, Koffman and Lemaire, 2013). Several studies have demonstrated that these sensors enable the efficient monitoring of key activities related to fall prevention, including mobility patterns, stair climbing and stand to sit transfers (Wang et al., 2017; Pozaic et al., 2016; Lord and Close, 2018). Sensory applications developed for smartphones provide accurate measurements of long-term activity, thereby opening up the possibility of remote sensing assessments into clinical care (Del Rosario et al., 2014).

The emergence of sensor technology offers the prospect of valid, cost effective and easy-to-implement falls risk assessment. A recent systematic review of twenty two studies found that four major sensing technologies (inertial sensors, video/depth cameras, pressure sensing platform and laser sensing) were reported to provide an accurate diagnostic for falls risk among older adults. However, the authors caution that variation in key sensor assessment variables, including measured parameters, movement tasks, and sensor sites, precludes generalization about the ability of sensing technology to predict future falls (Sun and Sosnoff, 2018). This finding mirrors the results of an earlier systematic review, which concluded that the body of sensor technology studies may be presenting over-optimistic results due to the considerable number of sensor-related variables, and that more prospective studies were required to permit external validation (Howcraft, Koffman and Lemaire, 2013).

### ***Gait Adaptability***

Gait adaptability refers to the ability to alter walking patterns quickly and appropriately in response to visual cues, such as avoiding obstacles or making precise foot movements on uneven surfaces (Lord and Close, 2018). Studies have assessed gait adaptability using measures with strong ecological credibility (Weerdesteyn et al., 2005; Caetano et al., 2018). Collectively these studies indicate that gait adaptability tests can be a value-added component of fall risk

assessments, and gait adaptability training could complement the existing repertoire of fall prevention exercises (Lord and Close, 2018). Examples of the latter could include multi-target stepping tasks (Yamada et al., 2011) or ‘virtual reality’ treadmills augmented with visual targets and obstacles (Heeren, van Ooijen and Geurts, 2013).

### ***New Approaches for Fall Prevention Exercises***

There is robust evidence that exercise is an effective means of preventing falls among older people. However, long-term adherence rates can be low, as many exercise programs are viewed as dull and repetitive with no consideration of effective strategies for sustainability (Lord and Close, 2018).

The emergence of smart phone and tablet exercise applications offer a range of enjoyable exercise programs for older adults and a potentially cost effective solution to longer-term engagement in exercise. To date, most of these apps have not been assessed through scientific trials, but some studies are in progress (Delbaere et al, 2015).

In an overview of innovations in fall prevention, Lord and Close (2018) review four emerging exercise options:

- **Multimodal and dual task training.** To date, trials of multimodal or dual task training have yielded mixed results, with limited evidence that combined training yields synergistic effects (Lord and Close, 2018). This may be due to lower exercise performance due to the distracting nature of multi-modal or dual task routines, which can involve unrelated cognitive tasks. It has also been noted that older people with significant balance problems should avoid multimodal exercises (Stack and Roberts, 2013). Further research is needed to determine the potential efficacy of these training regimens for the prevention of falls.
- **Exergames.** Interactive, exercise-based videogames appear to be an effective means of delivering multi-modal physical activities to prevent falls. A systematic review of 37 trials found that exergame training improved both physical (e.g., balance and strength) and cognitive (e.g., attention) measures and were equally effective as traditional exercise programs in reducing fall risk (Schoene et al. 2014).

- **Vocational step training.** Vocational step training focuses on taking rapid, accurate steps in multiple directions. It can be performed with step mats or incorporated into exergames. A systematic review of three trials found that vocational step training improved stepping reaction time, gait, balance, cognition, and was associated with a 57 percent reduction in falls (Okubo, Schoene and Lord, 2017).
- **Reactive Step Training.** Reactive step training involves exposure to repeated slips or trips in order to generate more rapid balance corrections. Systematic review evidence derived from four trials indicates that reactive step training can improve balance recovery following slips and reduce falls by 48 percent in older people (Okubo, Schoene and Lord, 2017).

### ***Vitamin D Supplementation***

Vitamin D supplementation remains a contentious intervention in the fall prevention toolbox. There is evidence that administration of Vitamin D has a positive effect on functional performance, reaction time and balance (Dhesi et al., 2004). As a result, Vitamin D supplementation has been implemented as fall prevention strategy in many RCTs, with the results collated in numerous meta-analyses (Lord and Close, 2018). However, methodological differences in these studies have led to highly divergent findings with respect to the efficacy of Vitamin D (Boland, Grey and Reid, 2014). Moreover, two large trials found that high doses of Vitamin D increase falls in at-risk older people (Sanders et al., 2010; Bischoff-Ferrari, Dawson-Hughes and Orav, 2016). These findings influenced the recent decision of the US Preventive Services Task Force to recommend against the use of Vitamin D supplements to prevent falls among older adults (Grossman et al., 2018).

### ***Hip Protectors***

Hip protectors designed to reduce serious injury by buffering the impact of a fall were the focus of a Cochrane Collaboration review of 14 trials which concluded that hip protectors could probably decrease the risk of hip fractures for older people living in care facilities (Santesso, Carrasco-Labra and Brignardello-Peterson, 2014). However, practical issues related to acceptability, compliance, hygiene and staff support may limit the extent to which hip protectors are adopted (Lord and Close, 2018).

### ***Safe Flooring***

Low impact flooring is another option for reducing the impact of a fall. A number of hospital-based studies carried out in the US, the UK and New Zealand found that low impact flooring can significantly reduce injuries and may also prevent fractures. One of the most recent studies, which compared low impact flooring with standard vinyl flooring in 20 bedrooms within a subacute geriatric ward, found that fall-related injuries were significantly less frequent when falls occurred in rooms fitted with low impact flooring (Hangar, 2017). Further studies of low impact flooring are ongoing, and a key challenge that has yet to be resolved is the identification of a low-impact flooring type that can effectively reduce injury without causing rolling resistance when moving heavy equipment such as beds or hoists (Lord and Close, 2018).

### 4.3 Key Factors Influencing the Impact of Fall Prevention Interventions

Despite the accumulating body of evidence that interventions, such as exercise, can achieve meaningful reductions in falls among older adults, the reality is that most fall prevention programs are only modestly effective. Moreover, the sustainability of positive impacts resulting from these initiatives is unknown as most studies end within 6 to 24 months (Hopewell et al., 2018). To address this problem, a number of studies have focused on the key enablers and barriers affecting the implementation of fall prevention initiatives, including compliance with recommended practices, challenges with translating evidence into clinical practice and enablers and barriers at the organization and community levels.

One of the key factors limiting the impact of fall prevention initiatives concerns the lack of alignment between the fall self-management strategies implemented by older adults and the recommended best practice guidelines for fall prevention. This finding was confirmed in a recent integrative review of seventeen studies assessing fall prevention management strategies used by community dwelling older adults (N=501) and their care providers (N=102) (Wilkinson et al., 2018). The actions reported by respondents only matched two of the evidence-based recommendations for preventing falls: home hazard assessment and modification and advice about measures to prevent falls. Of potentially greater concern, very few older adults reported performing any type of exercise to prevent falls, although this finding may be due to respondents not being asked about exercise and, therefore, failing to consider it as a fall prevention measure. Only a small number of caregivers reported seeking fall prevention advice from healthcare professionals or consulting evidence-based fall prevention guidelines (Wilkinson et al., 2018).

A key barrier to the successful implementation of - and compliance with - fall prevention strategies concerns the divergent perspectives of fall risk among older adults, families and health professionals. Some older adults express the view that increased fall risk is an inevitable part of aging and loss of independence, so no intervention can ultimately prevent a fall from occurring. Conversely, other older adults reject participation in interventions that stereotype them as being frail with diminished competence (Bunn et al, 2008; Child et al, 2012).

Several studies have focused on the organizational and community level barriers to the effective implementation of fall prevention interventions. A systematic review and synthesis of 19 qualitative studies conducted by Child et al. (2012) identified one overarching concept related to organizational and community factors. This concept, practical considerations, encompassed barriers to accessing fall prevention interventions (e.g., winter weather, lack of driving dependence), economic factors (e.g., inability to afford assistive devices) and time (e.g., fall prevention as one of a number of competing priorities in the healthcare system). Other qualitative studies of organizational and community level barriers to fall prevention have yielded consistent themes, including limited coordination and communication between key service providers, insufficient resources for fall prevention work, restrictive organizational mandates and the persistence of disciplinary 'silos' within the health care system that

discourage the level of cross-disciplinary collaboration needed to address complex health issues such as falls (Koh et al., 2008; Lognathan et al., 2015; Dykeman et al., 2018; Liddle et al., 2018; McEwan et al, 2018).

Many of the aforementioned barriers were noted by the interview respondents when asked to reflect on the key issues hindering a more coordinated, effective approach to preventing falls among older adults in the community. One of the key recurring themes, noted by several respondents, was the relatively low attention accorded to fall prevention as one of a number of competing priorities in older adults' health:

*"There's competing pressures. I love fall prevention. Obviously I'm passionate about it....but so is the person who's doing the other pieces: everybody thinks their issue is the most important."*

*"Because people have many other priorities. And it [fall prevention] is not part of the list of things that need to get done."*

*"A lot of the health care system...is looking at a whole slew of other things like waiting times in hospitals...So I think it's a matter of how you can squeeze fall prevention in and get the attention that it needs....very often it's over-ridden or over-shadowed by more pressing needs."*

Several respondents felt that the lower priority given to fall prevention arose from a lack of awareness or knowledge about the degree to which falls are preventable and the extent to which fall-related hospitalizations constitute a significant source of health care expenditures:

*"I think some of it is knowledge, the lack of understanding of how much falls are actually preventable. Similar to dementia, there's a feeling that 'well, old people fall.' It's just going to happen."*

*"I think partially there's a lack of awareness of the relationship between fall prevention, falls and other health conditions that might be leading to emergency department visits or hospital admissions...So we're treating hip fractures without really recognizing we need to treat the issues that led to the hip fracture."*

Another key barrier identified by respondents concerns the broad array of risk factors and risk conditions contributing to a fall. Several participants felt that the perceived complexity of fall prevention impeded more proactive responses:

*"I think one of the other barriers is that fall prevention isn't simple. There isn't a simple, cookie cutter approach like for stroke - you take your blood thinner to prevent a stroke. Fall prevention is more complex than that. And because it involves individualized risk factor assessment and individualized recommendations for patients, it's tricky or challenging to articulate that in a nice three-point soundbite."*

Another respondent elaborated upon complexity as a barrier by noting that many of the factors contributing to falls lie outside the locus of control of the health professionals assisting older people at risk of falls:

*“Family docs or primary care practitioners don’t like screening things they can’t do anything about...there’s a lot of nihilism there, a sense of futility. You have this frail person falling in front of you, or who’s fearful of falling. But all the things you could do to fix it fall outside the realm of your office.”*

The key organizational barrier, which was noted by a majority of respondents, concerned the lack of coordination and communication between the key stakeholders with a mandate to prevent falls among older adults. This lack of coordination was viewed as fostering a more fragmented response to fall prevention that limited the impact of key initiatives:

*“I think everything’s a bit too fragmented. I don’t think the Ministry’s providing the leadership that’s required. I don’t think the LHINs are necessarily on the same page about what’s expected of them and what their role is. I think there’s also a debate about who owns fall prevention. Is it the public health? Is it the LHINs? Because even the LHINs and public health aren’t aligned....So I just don’t think there’s any coherent vision.”*

*“There’s no central place for falls prevention programming and planning. Right now there’s a reason why we have our own fall prevention framework and another LHIN does, too. There is no provincial program in the Ministry that directly deals with falls...It comes from different areas and various divisions within the Ministry. So the challenge is you need to put a bucket around it.”*

*“We still operate in silos It’s possibly going to improve if public health becomes more integrated in functioning with the LHINs. But for now we’ve got the siloed approach of different sectors funded separately.”*

Two respondents expressed concern that the lack of a coordinated approach to fall prevention across the spectrum of the health care system, combined with lack of incentives for greater coordination, was resulting in the perpetuation of a ‘status quo’ that stifled innovation:

*“My worry is when I go to meetings people are doing ‘same-old, same old.’ They’re just rehashing strategies that don’t work anymore. As well, people will agree to work together, they’ll volunteer, maybe we’ll have these service-level agreements that don’t have any teeth to them. It’s a promise and if they break it there’s no implication. So that’s always a problem - that we’re using old strategies that have already maxed out.”*

*“So everybody knows how to do what they’re already doing. And hence there’s inertia that’s very strong....So that means that people have the incentives to keep doing what they’re doing*

*and not try something new...it's probably that they don't have a clear vision of how an alternative would be a lot better than the status quo."*

## 5. Towards an Integrated, Systems-Based Approach to Fall Prevention in Ontario

### 5.1 Definitions and Rationale

**Integration** in the health sector refers to methods and models designed to create greater connectivity, alignment and collaboration between key components of the health care system as well as other human service systems, such as social and community services (Leutz, 1999; Kodner and Spreeuwenberg, 2002). The ultimate goal of integration is to ensure that health service organizations from across the continuum of care work together to ensure that services are complementary and coordinated with a level of continuity that contributes to the achievement of desired outcomes within a holistic perspective (Cheng, 2018a).

A recent presentation by Cheng (2018a) provides a threefold rationale for a shift towards more integrated services that has the potential to increase the reach and effectiveness of fall prevention initiatives. First, by ensuring greater coordination and a more seamless transition between service providers, integrated services overcome the levels of ‘siloing’ and fragmentation that have been identified as key barriers to effective fall prevention efforts. Second, the more holistic approach offered by integrated services is more amenable to addressing the multiple intrinsic and extrinsic causes of falls as well as the complex needs of older adults at risk of falls. Lastly, integrated models of care offer the possibility of cost savings through reduced use of expensive tertiary care services and a greater focus on the preventive measures that have been proven to reduce injurious falls.

When asked to reflect on what ‘integration’ meant to them in the context of fall prevention, respondents emphasized the key attributes and desired outcomes of integrated health care noted in the published literature, such as a more coordinated, seamless and holistic approach to care provision:

*“That we have an integrated system where, you know, just because somebody comes through ER who has a fall, you obviously deal with their injury, treat them in hospital. But when they’re discharged it is now your responsibility to make sure they’re connected with the right community resources and programs...so integration to me is everyone being connected through a common mechanism and outcome that is client-centred.”*

*“Well, to me integration should mean that there is some seamless, if possible, transition between the multiple components of a fall prevention strategy. So that individuals, regardless of when they enter the system, should be able to receive services that aren’t just one-organization dependent. And so we shouldn’t have a situation where there has to be multiple referrals and duplication of assessment and information gathering.”*

Other respondents pointed to a more standardized approach to prevention, predicated upon evidence-based best practice, as a desired outcome of integration:

*“It means whatever the best practice is, whatever the procedure, the policy - that it becomes what we do....So to me integration is about the best practices becoming everyday work: it’s just what we do.”*

*“so that if somebody has a fall in Thunder Bay and somebody has a fall in Sarnia, what they should have access to has got to be grounded in a common denominator so that we’re not all just doing our own thing.”*

One respondent offered a perspective on integration that was divergent from those offered by other interviewees. This individual contended that meaningful integration required stringent funding requirements for effective coordination across the network of organizations involved in fall prevention:

*“Where the funding crosses services. And because it crosses services the operations start to link better together....So that may not be what integration means to others but that’s what it means to me. We always talk about integration being, you know, service level agreements and goodwill and that’s a pretty weak form of integration...this is more robust integration where you’re sharing funding and hence you’re sharing accountability and responsibility and operations.”*

**Systems thinking** is a set of analytic skills used to identify and understand systems, predicting their behaviours and designing modifications to bring about desired changes (Arnold and Wade, 2015). The application of systems thinking can help to guide a more integrated approach to fall prevention as it gives attention to relationships, boundaries and perspectives of key stakeholders and attempts to find ways to shift or re-combine system ‘parts’ to bring about improved system-based outcomes (Davidson and Morgan, 2018).

Systems thinking is premised on the notion that the function of complex systems is dependent upon interactions between heterogeneous elements that cannot be fully understood by examining these elements in isolation of one another (Jackson, 2003). Although formal definitions vary, there is broad consensus that complex systems (e.g., the health care system) embody the following properties (Jackson, 2003; Mitchell, 2009; Luke and Stamakis, 2012):

- complex systems are comprised of a large number of heterogeneous elements;
- these elements interact with one another;

- the interactions yield an emergent effect differing from the impact of individual elements;
- the effect persists over time and adapts to changing circumstances;

In response to a question asking them to reflect on the meaning of ‘systems-based’ in the context of fall prevention, respondents tended to describe the parameters of the fall prevention “system” (for lack of a better term) or the ultimate authority controlling the system.

*“Our system is I guess our funded services, our funded health care services.”*

*“When I think about it in simplest terms it’s about the many parts of a community that’s involved in a specific condition. So among older adults there’s many, many players in a community that can affect a fall among an older adult.”*

*“To me, ‘systems-based’ is really the government...so looking at a system to me is not only the health care system but also the social support system as well.”*

Some respondents had trouble articulating the features of a ‘system-based’ approach to fall prevention versus an ‘integrated’ approach to fall prevention. This is perhaps not surprising, given that the term systems-based is a bit more esoteric and not extensively applied to fall prevention. There was some tendency to reiterate the greater levels of collaboration and coordination accruing from greater integration as desirable attributes.

*“Systems based to me? Shared and collaborative planning at all levels of an organization.”*

*“So I think that a ‘systems-based’ approach needs to be connected to a variety of different sectors so that there’s similar work happening, and that it’s connected across the work that’s happening, whether that be in the hospital sector, the community sector, the home care sector.”*

*“that the various pieces within the health care system that address falls are at least coordinated.”*

One respondent questioned the utility of working towards a more integrated, systems-based approach to fall prevention. Specifically the interviewee thought that a lack of specificity around these concepts distracted from the more desired outcome of improved patient-centred care:

*“These are all key words that people like to use. ‘You have to be more integrated. You have to be more systems-based.’ But at the practical level what does that actually mean?.....because at the end of the day we haven’t built these systems. They don’t exist.... So I would much rather it be a patient-centred approach to care....like when that patient’s in front of me and their*

*eyesight's poor and they're hearing impaired and they can't drive and they're in pain....and they're weak and they're falling, I either need to have a care coordinator or a clinician holding on to every single one of those recommendations and moving them forward. And no system does that....it needs to be person-based.*

## 5.2 Perceived Degree of Integration of Fall Prevention Initiatives in Ontario

Leutz (1999) developed a useful taxonomy for assessing the level of service integration. Specifically, Lutz identifies three types of integration:

- **Linkage:** providers make attempts to work together, but within the constraints of their own organizational structure;
- **Coordinated:** organizations develop structures to facilitate better communication and information sharing and reduce barriers to collaboration;
- **Full Integration:** organizations combine resources, structures and funding for long-term, unified service provision.

Respondents offered mixed opinions when asked about the perceived degree to which fall prevention initiatives were integrated into complementary prevention or primary care initiatives in their communities. Some felt that integration was low to non-existent:

*“There’s almost zero meaningful integration because of the lack of funding and the lack of incentives.....You know we’re kind of at amateur-level integration and we need to go professional.”*

*“Wow, I think I’m fairly cynical about my answer. I mean I do this [fall prevention] as my business. And as a member of my municipality I have no idea if there’s anything going on around falls prevention work. Are sidewalks appropriately marked?.....are we creating more senior- friendly spaces...I’m not sure I know any of that.”*

Other respondents gave more qualified responses, noting that while some level of integration had been achieved, greater outreach with certain stakeholders and sectors was needed to create a more seamless, coordinated response to fall prevention at the community level:

*“So I would say we are probably somewhat integrated...so our fall prevention framework will serve as a tool to make sure we get more integrated with our community providers...so we still have some work to do but it’s not like we don’t have integration at all.”*

*“Our local coalition works hard to keep fall prevention at the forefront. It’s run through the public health unit and I think they’ve done an excellent job dealing with that end of the continuum. I don’t think we’ve done as great a job with integration at the other end: the emergency department, the acute care, the post-acute care.”*

*“Some of them are integrated quite well, and those are the ones the LHIN has control over. So if there’s governance by the LHINs it’s quite well integrated. But when it comes from grassroots organizations like ourselves it’s hard to penetrate that wall.”*

Two of the health care administration experts interviewed as part of the environmental cited the absence of meaningful integration across the provincial health care system as a barrier to a more integrated, cohesive approach to fall prevention at the community level:

*“We do not have integration. We have some good models or practice examples that have focused on a small eco-system. But overarchingly each organization has a separate vision, mission and set of strategic goals. Each is run and governed separately, and we do not have an integrated system of care in Ontario.”*

*“You know I would say it [integration] is piecemeal at best....so I actually don’t see a systematic approach routinely occurring across the LHINs that’s coherent at face value makes sense. And I can’t even articulate what integrated and systematic approach is even happening in my own LHIN for that matter.”*

### 5.3 Potential Models for Achieving a More integrated approach to Fall Prevention

At present, there are few known examples of integrated health and social services that serve older adults, and most of the known examples reflect a lower degree of integration, such as linkage or coordination efforts (Cheng, 2018a). Key informants interviewed for this environmental scan noted a number of models from other jurisdictions that could inform a more integrated approach to fall prevention in Ontario. These include:

- **Program of All-Inclusive Care for the Elderly (PACE).** For the past forty years, the US-based PACE program has provided high need elderly populations with integrated, seamless care by an interdisciplinary team across the care continuum. Evaluations of PACE, which is funded using a capitated, financing payment model, have found greater longevity, improved health outcomes and a superior quality of life for patients and their caregivers enrolled in the program. In addition, PACE has demonstrated that it can keep individuals in the community and delay admission to institutions for an average of two years (Cortez and Sullivan-Marx, 2016).
- **New Zealand Primary Care Strategy.** In 2001, New Zealand launched a primary care strategy focused on improving population health, reducing health inequities and improving the coordination of care. The strategy focused on the creation of integrated meso-level organizations including Independent Practitioner Associations Primary Health Organizations. The latter were funded on a capitation basis and held responsible for the health of their enrolled populations. Evaluations of the strategy revealed significant improvements, including increased service provision, reduced user fees and improvements in reaching key performance indicators such as cancer screening and flu and child vaccination rates (Cumming, 2011).
- **Program of Research to Maintain Services for Autonomy (PRISMA).** Launched in 1999 as a research project, PRISMA attempted to address the lack of continuity of care experienced by elderly people with chronic conditions in the Estrie Region of Quebec. In response to this problem, PRISMA established an integrated service delivery network that featured greater service coordination, a single entry point, case management and the development of individualized service plans. In 2001, the Ministry of Health and Social Services required all regions in Quebec to implement the key features of PRISMA, although each region has flexibility in determining how they are implemented. Evaluation of the model found significant reductions in the functional decline of clients, fewer reported unmet needs, reduced emergency room visits and a significant increase in client satisfaction and empowerment (MacAdam, 2015).

- **The Esther Network, JÖNKÖPING.** Launched in 1997, the Esther Network is an integrated health services initiative covering a population of 110,000 in JÖNKÖPING, a city in Southern Sweden. The program actively involves older clients with experience accessing health care system, who are recruited as advisors. The Network also utilizes trained coaches who work with their colleagues in the health system to ensure that services remain coordinated and patient-centred. Evaluations of the Esther Network have found a range of positive outcomes including increased client and staff satisfaction, reduced waiting times and lower health care costs (Davies, 2012).
- **The Public Bodies Act.** In 2014, the Scottish government passed the Public Bodies (Joint Working) Act that established the framework for the complete integration of health and social services in Scotland. As a result of the legislation, newly formed health and social care partnerships (HSCPs) have been established to plan and administer more seamless, integrated services (Bruce and Parry, 2015). While the Scottish model has the potential to achieve the benefits associated with integrated care models, it is still in its infancy so evaluations tying the model to client outcomes are not yet possible (Cheng, 2018b).

## 5.4 Recommendations for Creating a More Integrated, Systems-Based Approach to Fall Prevention in Ontario

Respondent suggestions for creating a more integrated, system-based approach to fall prevention in Ontario fell into one of three categories.

### 1. Increased advocacy and awareness raising through a provincial collaborative of key stakeholders

Several interviewees, both within and outside of the fall prevention sector, cited the need for concerted advocacy and awareness-raising to educate decision makers about the importance of investing in comprehensive, integrated fall prevention. Some collaborative of key stakeholders (e.g., a provincial fall prevention coalition) was regarded as the best means of achieving this objective.

*“I like the idea of having a provincial collaborative or a provincial group of some kind that would actually have some teeth to it....I think having that provincial meeting that’s being planned is a great first step.”*

*“I think what needs to happen - there needs to be serious advocating, a re-engagement of groups at the provincial and regional level - groups like public health, VON, seniors’ advocacy groups and the Ontario Neurotrauma Foundation...so look for strategic opportunities where fall prevention is an important component and use those to potentially leverage for other funds interests or resources to bring it to decision makers’ attention.”*

*“Falls being just as important as other chronic diseases like heart disease or cancer. So can we make that economic argument? Can we make that argument in terms of human suffering? So that’s really important. I don’t think we have.”*

One respondent, by contrast, offered a different interpretation. Specifically, this individual felt that advocacy efforts aimed at convincing decision makers to invest more resources in integrated fall prevention would be futile, and that greater progress would be realized through concerted, system-based planning initiated by the LHINs and other supportive organizations:

*“I don’t see this [fall prevention] as being a provincial priority by any mean. So I think this task group that is going to be meeting - maybe the best thing is to say ‘ok, if we’re going to take this work on ourselves we’re actually going to define what we believe each of the different players in the system can do...we want to reduce falls by 50 percent, and here’s our ten-point plan on what different parts of the system can do to achieve this...and I think someone needs to articulate that, and I don’t see the Ministry prioritizing this as an issue.”*

## 2. Greater education and awareness-raising about the benefits of a greater focus on fall prevention

A number of respondents also felt that awareness efforts needed to extend beyond decision makers to reach older adults, their caregivers and the general public about the benefits of fall prevention. This was viewed as critical for overcoming prevailing stereotypes that increased fall risk is an inevitable part of aging that cannot be prevented (Bunn et al, 2008; Hughes et al, 2008; Child et al, 2012).

*“The major challenge we have is getting people - for lack of a better word - excited or interested in this area and it has to do with education and just sort of telling people what the actual benefits would be in terms of return on investment....I think we need to educate people on how easily we can prevent falls in many situations and even morbidities and mortalities.”*

*“I think you need both compelling data and compelling stories....people react to stories. They need to kind of feel some attachment but realize this issue is not an N of 1. And that’s where the numbers come in.”*

*“I think it’s important to understand how we can create a falls prevention culture...It’s a weird thing to say, but that’s what we’re trying to do locally within our LHIN: make falls everyone’s business.”*

Respondents also identified the need for educational efforts emphasizing the need for regular, concerted exercise as a key component of an integrated fall prevention strategy. As was noted previously, the low success rate of many fall prevention programs may stem from a short implementation timeframe that fails to bring about sustainable changes in key behaviours, such as exercise (Walsh et al., 2018). This trend was noted by one respondent who played an active role in the delivery of fall prevention exercise classes for older adults at risk of falls:

*“So we collected these outcome measures...what we learned from the first few years of doing this class is that at the six month mark if people hadn’t either joined another class or kept up with exercise they were back to baseline. It’s like they hadn’t done anything at all.”*

Another respondent supporting the need for greater public education on the importance of exercise as a fall prevention felt that some ‘re-branding’ might be needed to increase the salience of the message:

*“Hopefully they don’t call them falls prevention programs. Hopefully they call them something far more interesting.”*

### **3. Greater provincial oversight around allocation of fall prevention resources, more minimum levels of programs/services and accountability measures.**

Many respondents felt that the barriers to effective, integrated fall prevention posed by lack of coordination and collaboration among key stakeholders and a heterogeneous ‘patchwork’ of programs could not be sufficiently resolved through voluntary measures. Rather, greater provincial oversight and more stringent mechanisms to hold stakeholders accountable for minimum standards of service provision were needed. Sample responses included:

*“And there could be some standards set for every LHIN to be offering a certain standard of services....so whether that needs to be a new body, or it could be overlaid on some sort of existing provincial table...I think that’s what actually needed to make it formalized.”*

*“So irrespective of who’s seeing the client there needs to be an accountability framework as well to hold people accountable for when there’s a fall.”...And that’s where I think there needs to be a provincial body that’s not just there for standards or quality, but in a capacity to advise the Ministry on who should get the appropriate allocation of falls funding based on some challenges they see in within different regions.”*

*“I think it’s the role of the province to basically set the standards that say this is kind of what we expect, these are the things we expect different groups to be and this is how we will enable the work that will occur. So, for example, if they say we think there’s good evidence for exercise in falls prevention we will, therefore, commit to this amount of money and these are the guidelines under which they should be administered and organized and this is how we expect data to be reported back.”*

*“It would be good if each public health unit was designated to have a certain FTE to focus on fall prevention.”*

*“Well, one mechanism to achieve integration would be through the quality improvement plans that many health service providers need to integrate into their work. So it’s about creating an expectation that falls prevention is something you focus on....we’ll fund you if you focus on this.”*

*“Yeah I think we need to look at funding and structure....we need to look at something very different from what we have now. We need to approach this the way we would stroke, cancer, heart disease. This is a huge problem. We need to make investments now.”*

## 6. Summary and Conclusion

Falls among older adults are preventable, but the complex etiology of falls necessitates multi-component approaches focusing on both intrinsic and extrinsic factors. Strategies addressing multiple risk factors have been shown to reduce the rate of falls by up to 24 percent (Gillespie et al., 2012). The implementation of effective multi-component strategies, in turn, requires continued multi-sectoral collaboration between key stakeholders, including government, LHINs, hospitals, public health units and primary care providers. This collaboration is best achieved through an integrated, system-based approach to service provision. It is hoped that this document will help to guide next steps towards an optimal level of integrated fall prevention interventions that will enable older Ontarians to enjoy more injury-free years and a higher quality of life.

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