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Practice Guidelines

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Preventing Falls and Reducing Injury from Falls

Third Edition

Registered Nurses' Association of Ontario
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Preventing Falls and Reducing Injury from Falls

Third Edition

Greetings from Doris Grinspun,

Chief Executive Officer, Registered Nurses' Association of Ontario

The Registered Nurses' Association of Ontario (RNAO) is delighted to present the third edition of the clinical Best Practice Guideline *Preventing Falls and Reducing Injury from Falls*. Evidence-based practice supports the excellence in service that health professionals are committed to delivering every day.

We offer our heartfelt thanks to the many stakeholders who are making our vision for best practice guidelines a reality, starting with the Government of Ontario, for recognizing RNAO's ability to lead the program and for providing multi-year funding. For their invaluable expertise and stewardship of this Guideline, I wish to thank the co-chairs of the expert panel, Sandra Ireland and Robert Lam. I also want to thank Dr. Valerie Grdisa, Director of the RNAO International Affairs and Best Practice Guidelines Centre, for her expertise and leadership. Thanks also to RNAO staff Susan McNeill (Guideline Development Lead), Verity White (Guideline Development Project Coordinator), Laura Legere (Lead Nursing Research Associate), and the rest of the RNAO Best Practice Guideline Program Team, for their intense work in the production of this Guideline. Special thanks to the members of the expert panel for generously providing their time and expertise to deliver a rigorous and robust clinical resource. We couldn't have done it without you!

Successful uptake of best practice guidelines requires a concerted effort from educators, clinicians, employers, policy-makers, and researchers. The nursing and health-care community, with their unwavering commitment and passion for excellence in patient care, have provided the expertise and countless hours of volunteer work essential to the development and revision of each Best Practice Guideline. Employers have responded enthusiastically by nominating best practice champions, implementing guidelines, and evaluating their impact on patients and organizations. Governments at home and abroad have joined in this journey. Together, we are building a culture of evidence-based practice.

We invite you to share this Guideline with your colleagues from other professions and with the patient advisors who are partnering within organizations, because we have so much to learn from one another. Together, we must ensure that the public receives the best possible care every time they come into contact with us—making them the real winners in this important effort.

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How to Use This Document

This nursing best practice guideline (BPG)[G*] is a comprehensive document that provides resources for evidence-based nursing practice[G]. It is not intended to be a manual or "how to" guide, but rather a tool to guide best practices and enhance decision-making for nurses[G] and other health-care providers[G] working with adults (18 years and older) who are at risk for falls [G] and fall injuries[G]. The Guideline should be reviewed and applied in accordance with both the needs of individual organizations or practice settings, and the needs and preferences of persons and their families[G] accessing the health system for care and services. In addition, the Guideline offers an overview of appropriate structures and supports for providing the best possible evidence-based care.

Nurses, other health-care providers, and administrators who lead and facilitate practice changes will find this Guideline invaluable for developing policies, procedures, protocols, educational programs and assessments, interventions, and documentation tools, and for supporting adherence to legislation, mandatory programs, and regulations in their practice settings. Nurses and other health-care providers in direct care will benefit from reviewing the recommendations and the evidence that supports them. We particularly recommend that practice settings adapt these guidelines in formats that are user-friendly for daily use.

If your organization is adopting this Guideline, we recommend the following approach:

1. Assess your existing falls prevention/injury reduction policies, procedures, protocols, and educational programs in relation to the recommendations in this Guideline.
2. Identify existing needs or gaps in your falls prevention/injury reduction policies, procedures, protocols, and educational programs.
3. Note the recommendations that are applicable to your setting and can be used to address your organization's existing needs or gaps.
4. Develop a plan for implementing the recommendations, sustaining best practices, and evaluating outcomes.
5. Consider bundling[G] evidence-based recommendations to achieve greater outcomes. These bundles can be created from a single guideline or from several guidelines to achieve the strategic goals and desired outcomes of the health-care organization.

Implementation resources, including the RNAO *Toolkit: Implementation of Best Practice Guidelines* (2012), are available at RNAO.ca.

For more information, see **Implementation Strategies**.

All of the RNAO BPGs are available for download on the RNAO website at RNAO.ca/bpg.
To locate particular BPGs, search by keyword or browse by topic.

We are interested in hearing how you have implemented this Guideline. Share your story with us at RNAO.ca/contact.

* Throughout this document, terms that are marked with a superscript G ([G]) can be found in the Glossary of Terms (**Appendix A**).

Purpose and Scope

Best practice guidelines are systematically developed, evidence-based documents that include recommendations for nurses and the interprofessional team[G], educators, leaders and policy-makers, and persons and their families on specific clinical and healthy work environment topics. BPGs promote consistency and excellence in clinical care, health policies, and health education, ultimately leading to optimal health outcomes for people, communities, and the health-care system.

This BPG replaces the RNAO (2011) BPG *Prevention of Falls and Fall Injuries in the Older Adult*, which was originally published in 2002 and then revised in 2005 and 2011.

The scope of the previous edition of this Guideline focused on older adults in hospital and long-term-care[G] settings. Since the publication of the 2011 supplement, RNAO received feedback from stakeholders[G] who were implementing the Guideline with adults of all ages and across health-care settings. In response to the need for an expanded scope, this edition focuses on the prevention of falls and fall injuries in all adults (>18 years) at risk for falls and receiving care from nurses and other health-care providers across the health-care continuum, including those living in the community.

Due to the expanded scope of the BPG, the literature search yielded a very large volume of primary studies. The RNAO Best Practice Guideline Program Team decided to limit the included evidence to reviews (e.g., systematic reviews[G], integrative reviews, critical reviews) and other clinical guidelines.

In April 2016, RNAO convened an expert panel to review the purpose and scope of the Guideline, determine inclusion and exclusion criteria, and confirm research questions for the systematic literature review. The RNAO expert panel was interprofessional in composition, comprising individuals with knowledge and experience in clinical practice, education, research, policy, and lived experience across a range of health-care organizations, practice areas, and sectors. These experts shared their insights on adults at risk for falls and fall injuries in all settings along the health-care continuum.

This Guideline aims to outline evidence-based approaches for preventing falls and reducing fall injuries for adults. The guiding principles and assumptions set out below align with this aim and inform the recommendations.

Guiding Principles

- Many falls are predictable and preventable.
- Some falls cannot be prevented; in these cases, the focus should be on proactively preventing fall injuries and decreasing the frequency of falls.
- Falls prevention is a shared responsibility within health care.
- Person- and family-centred care[G] is foundational to the care of people at risk for falls and fall injuries.
- The risks and benefits for the person should be considered when implementing interventions to prevent falls and minimize injuries.
- Competent adults have the right to take risks (i.e., make decisions or take actions that increase their risk for falls).

Assumptions

The following assumptions should be taken into consideration when reviewing and implementing the recommendations in this Guideline:

- Health-care providers practice within their scope, and recognize the limits of their knowledge and abilities.
- Health-care providers adhere to local legislation, professional practice standards, and ethical principles, where established.
- Health-care providers value and engage family, recognizing that some people do not have family, that others may not want or need their family to be involved, and that family members are not always willing or able to help.
- Substitute decision-makers (SDMs)[G] are involved in care when appropriate.

Intended Audience

Recommendations are provided at the following three levels:

- Practice recommendations[G] are directed primarily toward nurses who provide direct clinical care to adults at risk for falls across the continuum of care, including (but not limited to): primary care, home care[G], hospital care, and long-term care settings. The secondary audience of the practice recommendations includes other members of the interprofessional team who collaborate with nurses to provide comprehensive care. All of the recommendations are applicable to the scope of practice of registered nurses and nurse practitioners (general and extended classes); however, many are also applicable to other health-care providers.
- Education recommendations[G] are directed at individuals and organizations responsible for the education of health-care providers, such as educators, quality improvement teams, managers, administrators, academic institutions, and professional organizations.
- Organization and policy recommendations[G] are directed at those managers, administrators, and policy-makers responsible for developing policy or securing the supports required within health-care organizations that enable the implementation of best practices.

For optimal effectiveness, recommendations in these three areas should be implemented together.

Application of This Guideline

Evidence reviewed for this Guideline included studies conducted in three main health-care settings[G]: community (i.e., primary care, home care), hospital, and long-term care. Whenever possible, the research referenced within the discussions of evidence is described based on the three settings. RNAO recognizes that these three settings may not capture all health-care organizations. Due to resource constraints in rural and remote locations, the application of these recommendations may not be fully realized. Organizations and health-care providers are encouraged to critically review the recommendations and determine applicability within their practice settings and communities. For example, these recommendations may apply to other settings such as public health, mental health services and supports, ambulatory clinics, and other organizations.

The systematic review demonstrated that the majority of evidence focused on older adults (adults 65 years and older). Some exceptions included younger adults at risk as a result of health conditions (e.g., haemophilia) or chronic diseases (e.g., neuromuscular conditions). The general terms "person/people" or "adults" are used in the BPG rather than specifying interventions that apply to "older" or "younger" adults. However, RNAO suggests that health-care providers critically review the recommendations and determine applicability to young adults at risk for falls. Further research is needed to explore best practices for falls prevention/injury reduction in some settings and for adults under 65 years of age (see **Research Gaps and Future Implications** for more information).

Concepts That Align with This Guideline

The following concepts may further inform health-care providers' implementation of this Guideline. Refer to **Appendix B** for additional resources on these topics:

- alternative approaches to restraints[G]
- care transitions[G]
- cultural sensitivity[G]
- implementation science[G]
- intra-professional[G] collaboration
- interprofessional collaboration
- motivational interviewing[G]
- person- and family-centred care
- self-management
- social determinants of health[G]

Topics Outside the Scope of This Guideline

The following topics are not covered in this Guideline:

- population-level falls prevention strategies,
- workplace/industry-related falls,
- intentional falls,
- sport-related falls,
- falls among children (<18 years old), and
- building environment or environmental design outside of settings specified for this Guideline (e.g., design of curbs and sidewalks in communities).

For more information about the Guideline development process, the systematic review, and search strategy, refer to **Appendices C** and **D**.

Interpretation of Evidence

Levels of evidence are assigned to study designs to rank how well each study design is able to eliminate alternate explanations of the phenomena under study. The higher the level of evidence, the more likely it is that there were fewer potential sources of bias influencing the research findings. However, levels of evidence do not reflect the quality of individual studies or reviews.

In some cases, recommendations in this BPG are assigned more than one level of evidence. This reflects the varied study designs that support the recommendation. For transparency, the level of evidence for each component of the recommendation statement is identified.

Table 1: Levels of Evidence

LEVEL	SOURCE OF EVIDENCE
Ia	Evidence obtained from meta-analysis[G] or systematic reviews of randomized controlled trials[G], and/or synthesis of multiple studies primarily of quantitative research.
Ib	Evidence obtained from at least one randomized controlled trial.
IIa	Evidence obtained from at least one well-designed controlled study[G] without randomization.
IIb	Evidence obtained from at least one other type of well-designed quasi-experimental study[G], without randomization.
III	Synthesis of multiple studies primarily of qualitative research[G].
IV	Evidence obtained from well-designed non-experimental observational studies, such as analytical studies[G] or descriptive studies[G], and/or qualitative studies.
V	Evidence obtained from expert opinion or committee reports, and/or clinical experiences of respected authorities.

Adapted from the Scottish Intercollegiate Guidelines Network (Scottish Intercollegiate Guidelines Network [SIGN], 2011) and Pati (2011).

For information on the systematic review process and how studies are appraised for quality, see **Appendix D**.

Quality of Evidence

In addition to the levels of evidence, the quality of each of the reviews cited in the discussion of evidence was appraised and categorized as strong, moderate, or low based on the AMSTAR instrument for reviews. The quality rating is calculated by converting the score on the AMSTAR tool into a percentage. When other guidelines informed the recommendation and discussion of evidence, the AGREE II instrument was used to determine the quality rating. **Tables 2** and **3** highlight the quality scores required to achieve a strong, moderate, or low quality rating.

Table 2: Quality Rating for Reviews Using the AMSTAR Tool*

QUALITY SCORE ON THE AMSTAR	OVERALL QUALITY RATING
Greater than, or equal to, a converted score of 82.4%	Strong
A converted score of 62.5 – 82.4%	Moderate
Less than, or equal to, a converted score of 62.4%	Low

* It is important to recognize that the overall quality of the systematic review may be low, but that the primary studies included in the review may have a higher quality rating if appraised individually. For information on the quality rating of the primary studies, health-care providers must refer to the referenced systematic review. For detailed explanation of the systematic review process and quality appraisal, refer to **Appendix D**.

Table 3: Quality Rating for Guidelines Using the AGREE II Tool

QUALITY SCORE ON THE AGREE II	OVERALL QUALITY RATING
A score of 6 or 7 on the overall guideline quality	Strong
A score of 5 on the overall guideline quality	Moderate
A score of less than 4 on the overall guideline quality	Low (Not used to support recommendations)

Summary of Recommendations

This Guideline replaces the RNAO BPG *Prevention of Falls and Fall Injuries in the Older Adult* (2002, 2005) and its supplement (2011).

+ The recommendation and supporting evidence were updated following the systematic review.
NEW A new recommendation was developed following the systematic review.

PRACTICE RECOMMENDATIONS	LEVEL OF EVIDENCE	STATUS
1.0 Research Question #1: What are the most effective ways to identify adults at risk for falls or for injury due to falls?		
Recommendation 1.1: 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: ■ identifying a history of previous falls; ■ identifying gait, balance, and/or mobility difficulties; and ■ using clinical judgment.	Ia & V	**NEW**
Recommendation 1.2a: 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.	III	**+**
Recommendation 1.2b: 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.	V	**NEW**

PRACTICE RECOMMENDATIONS	LEVEL OF EVIDENCE	STATUS
2.0 Research Question #2: What interventions are effective in preventing falls and reducing the risk for falls or falls-related injury among at-risk adults?		
Recommendation 2.1: Engage adults at risk for falls and fall injuries using the following actions: ■ explore their knowledge and perceptions of risk, and their level of motivation to address risk; ■ communicate sensitively about risk and use positive messaging; ■ discuss options for interventions and support self-management; ■ develop an individualized plan of care in collaboration with the person; ■ engage family (as appropriate) and promote social support for interventions; and ■ evaluate the plan of care together with the person (and family) and revise as needed.	Ia, III, & V	**NEW**
Recommendation 2.2: 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.	Ia & V	**+**
Recommendation 2.3: 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.	V	**NEW**
Recommendation 2.4: Implement a combination of interventions tailored to the person and the health-care setting to prevent falls or fall injuries.	Ia	**+**
Recommendation 2.5: 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.	Ia	**+**

PRACTICE RECOMMENDATIONS	LEVEL OF EVIDENCE	STATUS
Recommendation 2.6: 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: ■ identify polypharmacy and medications that increase risk for falls; ■ conduct a medication review, or refer to an appropriate health-care provider and/or the prescriber; and ■ monitor for side effects of medications known to contribute to risk for falls.	Ia & V	+
Recommendation 2.7: Refer adults at risk for falls or fall injuries to the appropriate health-care provider for advice about vitamin D supplementation.	V	**NEW**
Recommendation 2.8: 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.	V	+
Recommendation 2.9: 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.	Ia	+
3.0 Research Question #3: What interventions or processes should occur immediately following a fall?		
Recommendation 3.1: After a person falls, provide the following interventions: ■ conduct a physical examination to assess for injury and to determine the severity of any fall injuries; ■ provide appropriate treatment and care; ■ monitor for injuries that may not be immediately apparent; ■ conduct a post-fall assessment to determine factors that contributed to the fall; ■ collaborate with the person and the interprofessional team to conduct further assessments and determine appropriate interventions; and ■ refer the person to the appropriate health-care provider(s) for physical rehabilitation and/or to support psychological well-being (as needed).	III & V	+

EDUCATION RECOMMENDATIONS	LEVEL OF EVIDENCE	STATUS
4.0 Research Question #4: What content and educational strategies are necessary to effectively educate nurses and other health-care providers to prevent falls and injury from falls?		
Recommendation 4.1: Educational institutions incorporate content on falls prevention and injury reduction into health-care education and training programs.	V	+
Recommendation 4.2: 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.	Ia	+
ORGANIZATION AND POLICY RECOMMENDATIONS	**LEVEL OF EVIDENCE**	**STATUS**
5.0 Research Question #5: What organizational policies and system-level supports are required to help prevent falls and injuries from falls among at-risk adults?		
Recommendation 5.1: To ensure a safe environment: ■ implement universal falls precautions, and ■ identify and modify equipment and other factors in the physical/structural environment that contribute to risk for falls and fall injuries.	Ia	+
Recommendation 5.2: 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.	Ia	NEW
Recommendation 5.3: Implement rounding as a strategy to proactively meet the person's needs and prevent falls.	Ia	NEW

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Declarations of competing interests that might be construed as constituting an actual, potential, or apparent conflict were made by all members of the expert panel, and members were asked to update their disclosures throughout the Guideline development process. Information was requested about financial, intellectual, personal, and other interests, and documented for future reference. No limiting conflicts were identified. Details regarding disclosures are available at RNAO.ca/bpg/guidelines/prevention-falls-and-fall-injuries.

Stakeholder Acknowledgment

As a component of the Guideline development process, RNAO is committed to obtaining feedback from nurses and other health-care providers from a wide range of health-care organizations, practice areas, and sectors; knowledgeable administrators and funders of health-care services; and stakeholder associations. Stakeholders representing diverse perspectives were solicited* for their feedback, and RNAO wishes to acknowledge the following individuals for their contribution in reviewing this Guideline.

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*Stakeholder reviewers for RNAO BPGs are identified in two ways. First, stakeholders are recruited through a public call issued on the RNAO website (RNAO.ca/bpg/get-involved/stakeholder). Second, individuals and organizations with expertise in the Guideline topic area are identified by the Best Practice Guideline Program Team and the expert panel, and are directly invited to participate in the review.

Stakeholder reviewers are individuals with subject matter expertise in the Guideline topic or who may be affected by the implementation of the Guideline. Reviewers may be nurses and other point-of-care health-care providers, nurse executives, administrators, researchers, members of the interprofessional team, educators, nursing students, or persons and family. RNAO aims to solicit stakeholder expertise and perspectives representing diverse health-care sectors, roles within nursing and other professions (e.g., clinical practice, research, education, and policy), and geographic locations.

Reviewers are asked to read a full draft of the Guideline and participate in the review prior to its publication. Stakeholder feedback is submitted online by completing a survey questionnaire. The stakeholders are asked the following questions about each recommendation:

- Is this recommendation clear?
- Do you agree with this recommendation?
- Is the discussion of evidence thorough and does the evidence support the recommendation?

The survey also provides an opportunity to include comments and feedback for each section of the Guideline. Survey submissions are compiled and feedback is summarized by the RNAO Best Practice Guideline Program Team.

Together with the expert panel, RNAO reviews and considers all feedback and, if necessary, modifies the Guideline content and recommendations prior to publication to address the feedback received.

Stakeholder reviewers have given consent to the publication of their names and relevant information in this Guideline.

Background Context

Definition

A fall is "an event that results in a person coming to rest inadvertently on the ground or floor or other lower level, with or without injury" (World Health Organization [WHO], 2016). Falls have also been described as a complex multifactorial phenomenon (Al-Aama, 2011), a syndrome, and an indication of an emerging or worsening health condition (American Medical Directors Association [AMDA], 2011b).

Personal and Economic Costs of Falls

When a person experiences a fall, the impact can be life-changing. Some physical injuries, such as abrasions or bruising, may be temporary or relatively minor; other injuries, such as hip fracture or head injury, will lead to hospitalization or even possibly death (AMDA, 2011a). Fall injuries can greatly affect a person's quality of life and can result in varying degrees of lost independence, which in some cases may require alternate living arrangements (LHIN Collaborative, 2011). Falls can cause a series of negative and compounding effects. For example, when a person falls they may become anxious, less confident, and afraid of falling in the future. This may lead to social withdrawal and reduced physical activities, causing deconditioning, muscle weakness, and a greater risk of falling again (Gagnon & Lafrance, 2014).

In addition to the personal 'costs,' falls are expensive for the health-care system. It is estimated that falls cost the Canadian health-care system $8.7 billion per year (Parachute, 2015). Older adults are hospitalized on average 22 days for falls, which exceeds other causes for admission in this population (Public Health Agency of Canada [PHAC], 2014). Nurses and other health-care providers have a central role to play in reducing these expenditures by leading evidence-based falls prevention initiatives, and by implementing and evaluating the strategies identified in this Guideline.

Magnitude of Falls

Of all the types of injuries in Canada, falls are the leading cause of injury deaths, hospitalizations, permanent total disabilities, and permanent partial disabilities (Parachute, 2015). Approximately 30 percent of people over age 65 living in the community fall at least once per year, and this number increases to 50 percent for those 80 years of age and older (National Institute for Health and Care Excellence [NICE], 2013). PHAC (2014) reported that 95 percent of all hip fractures are directly attributable to falls, and that 20 percent of these ultimately prove fatal.

Falls Prevention and Health Promotion Initiatives

Falls prevention has become a health, safety, and quality improvement priority owing to the magnitude, detrimental effects, and economic impact of falls. In the community, some public health organizations have mandated health programs and services that address falls prevention (e.g., Ontario Public Health Standards). Population health promotion initiatives contribute to falls prevention by promoting the conditions and environments that support healthy living and the adoption of healthy behaviours (PHAC, 2014).

Falls prevention programs are often mandated in hospital and long-term care settings, and compliance is routinely monitored. For example, Accreditation Canada (2016) has a Required Organizational Practice (ROP) for falls prevention that is applicable to most health-care settings. This requires organizations to implement and evaluate a documented and coordinated approach for falls prevention. In Ontario, Canada, falls prevention and management is a required program with strict compliance measurement for long-term care homes.

Risk Factors

Over 400 risk factors for falls have been identified (College of Occupational Therapists [COT], 2015). These risk factors are described and classified in various ways, including as modifiable (i.e., amenable to interventions) and non-modifiable (i.e., unchangeable, such as age). Other classifications include biological (intrinsic), environmental (extrinsic), behavioural, social, and economic (Degelau et al., 2012; Scott, 2012). Regardless of classification, it is important to note that for many people, the factors are complex and interrelated (PHAC, 2014).

Factors within health-care organizations may also increase the risk for falls—for example, problems associated with assessment processes and inconsistent interventions (Degelau et al., 2012), or poor coordination across health-care settings and failures in communication (Canadian Patient Safety Institute [CPSI], 2013).

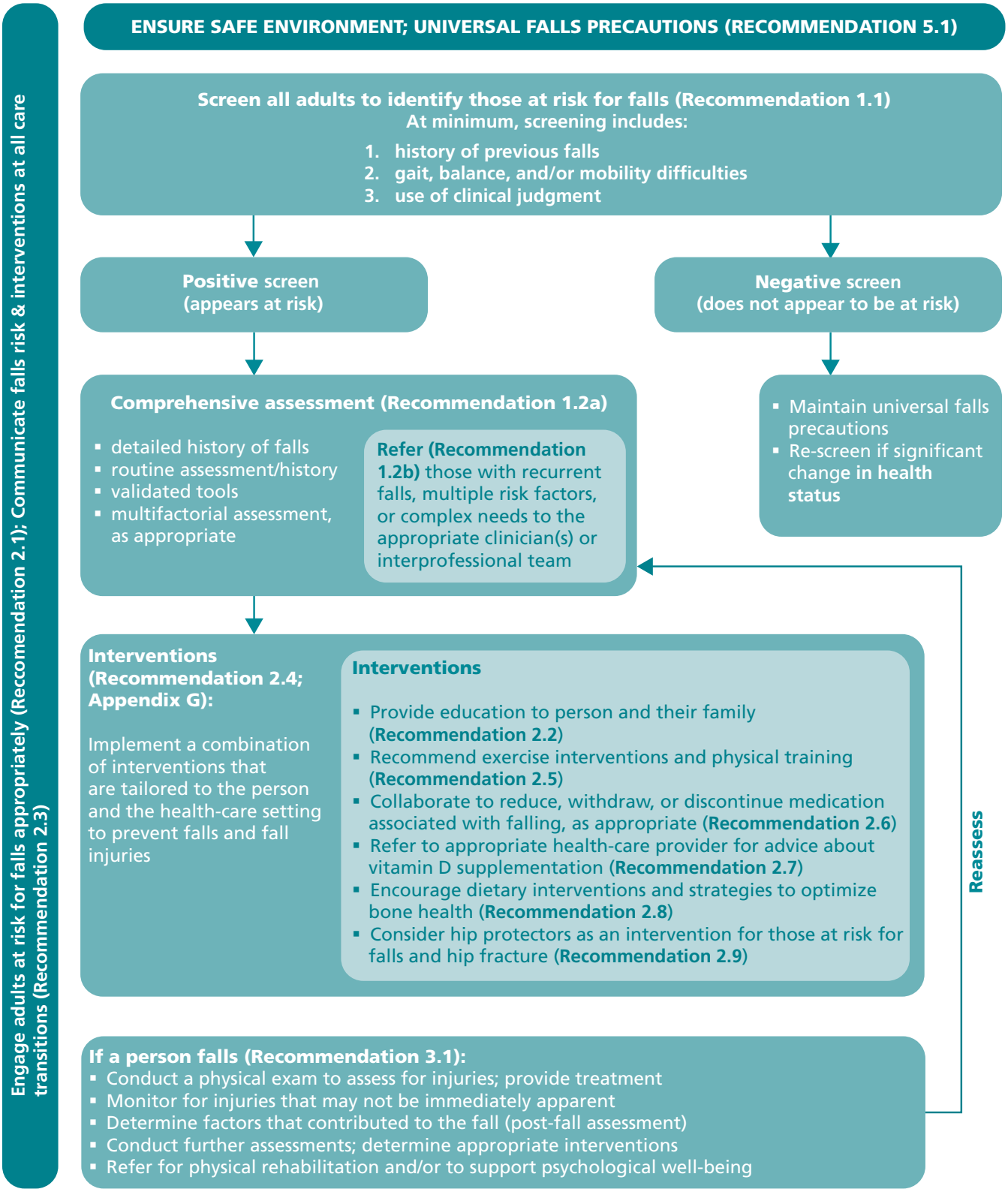
Balancing Risks and Benefits

Preventing or reducing falls and injury from falls requires a balance between reducing the risks and maintaining a person's freedom, dignity, and quality of life (AMDA, 2011a). When trying to prevent a person from falling, family members, caregivers, and health-care providers may focus on preventative measures that inadvertently constrain the person's independence (Miake-Lye, Hempel, Ganz, & Shekelle, 2013). Health-care organizations are cautioned to avoid "an excessively custodial and risk averse approach" (Australian Commission on Safety and Quality in Health Care, 2009). Organizational vigilance is required to avoid harmful or adverse approaches aimed at preventing falls, such as physical restraints, sedating medications, or restricting mobility (Miake-Lye et al., 2013).

Flow Chart

The following flow chart summarizes the steps, context, and considerations involved in falls prevention and injury reduction.

Figure 1: Flow Chart for Falls Prevention and Injury Reduction



Source: Created by RNAO.

Practice Recommendations

1.0 RESEARCH QUESTION #1:
What are the most effective ways to identify adults at risk for falls or for injury due to falls?

RECOMMENDATION 1.1:

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 (Level of Evidence = V).

Screening should include the following approaches (Level of Evidence = Ia):

- identifying a history of previous falls;
- identifying gait, balance, and/or mobility difficulties; and
- using clinical judgment.

Level of Evidence: Ia & V
Quality of Evidence: Reviews = strong, moderate, and low; guidelines = strong; expert panel

Discussion of Evidence:

Screening[G] approaches should be used in hospital, long-term-care, and community settings[G] to identify adults at risk for falls (COT, 2015; NICE, 2013; U.S. Preventive Services Task Force, 2012; Wallis & Campbell, 2011). Screening refers to a brief process that is used to identify individuals requiring assessment of risk factors and personalized interventions (see **Recommendation 1.2a** for information on comprehensive assessments[G], including multifactorial assessment, and **Recommendation 2.4** for individualized interventions). Screening involves asking about previous falls; observing and/or asking about gait, balance, or mobility difficulties; and applying clinical judgment[G] to determine a person's risk for falls. The expert panel suggests that screening should be integrated into other care processes, such as admission assessments, whenever possible.

History of Previous Falls

A history of previous falls is a strong indicator of risk, across health-care settings and particularly among older adults (Ambrose, Cruz, & Paul, 2015; Ambrose, Paul, & Hausdorff , 2013; Boelens, Hekman, & Verkerke, 2013; Callis, 2016; Deandrea et al., 2013; Vieira, Freund-Heritage, & da Costa, 2011; Zhao & Kim, 2015). As such, identifying a history of falls is an important component of risk screening (COT, 2015; NICE, 2013; U.S. Preventive Services Task Force, 2012; Wallis & Campbell, 2011). Flaherty and Josephson (2013) recommend asking about near-falls, slips, missteps, and fear of falling. This sample question could be used to obtain the history of falls: "In the past year, have you had any fall, including a slip or trip, in which you lost your balance and landed on the floor or ground or lower level?" (Lamb, as cited in Gillespie et al., 2012). The timeframe was changed from "month" to "year" to align with current evidence (NICE, 2013; Wallis & Campbell, 2011). Health-care providers may adapt the question to their clinical context.

Impaired Gait, Balance, and/or Mobility

Adults with gait, balance and/or mobility impairments across health-care settings are at increased risk for falls (Ambrose et al., 2015; Ambrose et al., 2013; Boelens et al., 2013; Callis, 2016; NICE, 2013; U.S. Preventive Services Task Force, 2012; Wallis & Campbell, 2011; Zhao & Kim, 2015). Health-care providers should be cognizant of these risks, and should observe ambulation for apparent disturbances or abnormalities (e.g. unsteady gait, poor balance, impaired mobility) and ask questions regarding any challenges related to these three areas.

Other Risk Factors

It is not feasible to address all of the possible falls risk factors during a brief screening. Health-care organizations may choose to include those factors that are especially relevant to their particular population or setting in their falls screening. The most commonly cited risk factors include the following:

- Advanced age (Ambrose et al., 2015; Ambrose et al., 2013; Vieira et al., 2011; Zhao & Kim, 2015);
- Polypharmacy[G] and use of particular medications, such as psychotropic medications[G] (Callis, 2016; COT, 2015; U.S. Preventive Services Task Force, 2012; Vieira et al., 2011); and
- Cognitive impairment (Ambrose et al., 2015; Ambrose et al., 2013; Vieira et al., 2011; Zhao & Kim, 2015).

Refer to **Appendix E** for a comprehensive list of risk factors and health conditions associated with falls and fall injuries.

Clinical Judgment

Clinical judgment is integral to identifying adults at risk for falls. It is defined as "the application of information based on actual observation of a person combined with subjective and objective data that lead to a conclusion" ("Clinical judgment," 2009). Nurses and other health-care providers require training on falls prevention and injury reduction to translate this knowledge and use their critical thinking to make sound clinical judgments (see **Recommendation 4.2** for more information on education). For example, health-care providers may consider certain factors, such as evolving illnesses (e.g., emerging delirium, impaired mobility, or new medications being prescribed) or unfamiliar surroundings, together with their acquired knowledge, other observations, and assessments (NICE, 2013).

One review and one guideline underscore the importance of clinical judgment in determining risk for falls in hospital settings (da Costa, Rutjes, Mendy, Freund-Heritage, & Vieira, 2012; NICE, 2013), particularly among elderly rehabilitation patients (da Costa et al., 2012). A review rated low quality reported similar findings for long-term-care settings (Wallis & Campbell, 2011). Although the literature on community settings did not highlight clinical judgment with regard to risk assessment, the expert panel asserts that clinical judgment is essential in all settings and aspects of care. To incorporate clinical judgment into the admission screening, the following question may be included: "Based on your screening questions, your observations and clinical judgment, does this person appear to be at risk for falls?"

Timing and Frequency of Screening

Literature on when to screen for falls risk was not found. The expert panel recommends that screening occur on admission (to hospital, long-term care, or home-care service) or after a significant change in health status that may affect the person's risk for falls (e.g., stroke, delirium). For adults living in the community, three guidelines recommend that screening should occur at least annually (COT, 2015; NICE, 2013; U.S. Preventive Services Task Force, 2012).

Screening or Risk Prediction Tools

None of the reviews or guidelines identified any particular tools that can be used to consistently or reliably to identify falls risk in hospital or community settings (Callis, 2016; Cumbler, Simpson, Rosenthal, & Likosky, 2013; Matarese, Ivziku, Bartolozzi, Piredda, & De Marinis, 2015; NICE, 2013; U.S. Preventive Services Task Force, 2012). Risk prediction tools aim to calculate a person's risk of falling, either in terms of 'at risk/not at risk' or in terms of 'low/medium/high risk.' Da Costa et al. (2012) found the use of clinical judgment to be as effective as risk prediction tools for older adult patients in rehabilitation hospitals. NICE (2013) explicitly advises against the use of risk prediction tools in hospitals. See **Appendix F** for an overview of approaches and tools used to assess risk for falls. Note that **Appendix F** summarizes findings from the systematic review; it is not a comprehensive list of all available tools.

Caution: The literature does not currently support the use of risk prediction tools[G] in hospitals as a stand-alone approach to screening.

RECOMMENDATION 1.2a:

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.

Level of Evidence: III
Quality of Evidence: Reviews = strong and moderate; guidelines = strong

RECOMMENDATION 1.2b:

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.

Level of Evidence: V
Quality of Evidence: Guideline = strong; expert panel

Discussion of Evidence:

When adults are identified as at risk for falls, a comprehensive assessment must be conducted to identify factors contributing to their risk (Ambrose et al., 2013; Zhao & Kim, 2015). This assessment should identify modifiable risk factors to guide selection of appropriate interventions to prevent or reduce falls and fall injuries (Ambrose et al., 2013; Zhao & Kim, 2015). Comprehensive assessments should be conducted by a health-care provider with the appropriate knowledge, skills, and experience (NICE, 2013). In some cases, the assessment may start in one health-care setting and be transitioned to another setting or completed with other health-care providers (e.g., started in the emergency department and completed in primary care).

Comprehensive Assessment: Components

Details of falls history

For adults who have fallen in the past year, obtain detailed information about the history of the fall(s), such as the frequency and context (COT, 2015; NICE, 2013; U.S. Preventive Services Task Force, 2012). The person should also be asked about what might have contributed to the fall (e.g., prodromal symptoms such as dizziness, palpitations, etc.), environmental factors, and the details of any injuries that may have occurred (Ambrose et al., 2015). Collecting this information can provide insight into risk factors or conditions (e.g., gait problems, low blood pressure) that require intervention.

Routine assessments/health histories

It is important for health-care providers to identify individual risk factors and high-risk groups (Changqing et al., 2015; COT, 2015; Gillespie et al., 2012; NICE, 2013). The expert panel recommends that admission/intake assessments, physical examinations, or health and social histories routinely conducted within health-care settings can be used to identify factors associated with risk for falls. For example, histories may detect biological, behavioural, psychological, and/or socio-economic risk factors and health conditions associated with an increased risk for falls.

During admission/intake assessments, health-care providers should also identify adults at risk for injury and heightened risk for fracture or bleeding. Minimal evidence was found to identify those most at risk of sustaining an injury from a fall. However, high-risk groups include adults with a history of fracture, osteoporosis, and haemophilia (Flaherty & Josephson, 2013; Papaioannou et al., 2015). See **Appendix E** for a list of common risk factors and health conditions associated with an increased risk for falls.

Validated tools

Validated[G] or standardized tools can be used as one component of a comprehensive assessment for falls risk. Tools can support identification of impaired cognition, issues with gait or balance, fear of falling, and fracture risk. Some tools are only appropriate for use in specific settings and others for specific populations or conditions (e.g., people who have had a stroke). Proper administration of tools requires time, expertise, and clinical judgment (NICE, 2013). **Appendix F** provides a summary of findings regarding various tools and approaches used to support a falls risk assessment. Organizational supports and structures, including health-care-provider education, are required. See **Recommendation 4.2** and **Recommendation 5.2** for more information.

Multifactorial assessments

Multifactorial assessments[G] are one element of a comprehensive assessment. They include an in-depth exploration of the multiple factors or conditions contributing to risk for falls, and involve members of an interprofessional team. The following factors may be considered: gait, balance, and mobility; muscle weakness; osteoporosis risk; functional ability; fear of falling; visual impairment; cognitive impairment; neurological examination; urinary incontinence; home hazards; cardiovascular examination; and medication review[G] (NICE, 2013).

Although multifactorial assessments are common in long-term care (Neyens et al., 2011; Vlaeyen et al., 2015), for community dwellings for older adults (COT, 2015; NICE, 2013; U.S. Preventive Services Task Force, 2012), and among at-risk populations in hospitals (NICE, 2013), multifactorial assessments may not be routinely necessary (NICE, 2013; U.S. Preventive Services Task Force, 2012). Multifactorial assessments are time- and resource-intensive. Further, in terms of reducing falls, it is difficult to determine the benefit attributable to multifactorial assessments compared to the interventions, as both are studied together. Reviews and guidelines examining community, hospital, and long-term-care settings suggest that the overall benefits of multifactorial assessments and interventions may be small (DiBardino, Cohen, & Didwania, 2012;

Gillespie et al., 2012; Papaioannou et al., 2015; U.S. Preventive Services Task Force, 2012). The lack of evidence may be attributable to inconsistency in measurement of falls risk (DiBardino et al., 2012). Further research is needed to explore these outcomes. See **Recommendation 2.4** for additional explanation.

Determining if a multifactorial assessment is appropriate

The following considerations may be used to determine if a multifactorial assessment is appropriate. Health-care providers may find that these considerations are applicable to other age groups or settings, based on their clinical judgment:

- Multifactorial assessments *for all older adults* (65 years and older) who (1) present to a health-care provider or organization because of a fall; (2) have experienced recurrent falls[G] in the past year; and (3) have abnormalities of gait and/or balance (NICE, 2013).
- In community settings, health-care providers and patients discuss whether a multifactorial risk assessment is appropriate, taking into consideration "the circumstances of prior falls, comorbid medical conditions, and patient values" (U.S. Preventive Services Task Force, 2012, p. 5).
- In hospital settings, focus multifactorial assessments on factors that can be "treated, improved or managed during their expected stay" (NICE, 2013, p. 15).

Referral

Adults with recurrent falls, multiple risk factors, or complex needs may require a referral to a specialized health-care provider or to the interprofessional team for further assessment and appropriate interventions. For example, disruption in balance could indicate dysfunction of somatosensory, visual, or vestibular systems (Flaherty & Josephson, 2013) and may require specialized assessment by a neurologist or neurology clinic. In some settings, a falls clinic comprised of an interprofessional team is available for at-risk adults. Other organizations may provide access to particular health-care providers, such as a physiotherapist, physiatrist, dietician, pharmacist, gerontologist, neurologist, or other specialist. Additional examples include optometry, for visual disturbances; occupational therapy, to assess the person in their home; and social work, to assess the person's ability to afford equipment to prevent falls.

2.0 RESEARCH QUESTION #2:

What interventions are effective in preventing falls and reducing the risk for falls or falls-related injury among at-risk adults?

RECOMMENDATION 2.1:

Engage adults at risk for falls and fall injuries using the following actions:

- explore their knowledge and perceptions of risk, and their level of motivation to address risk (Level of Evidence = III);
- communicate sensitively about risk and use positive messaging (Level of Evidence = III);
- discuss options for interventions and support self-management (Level of Evidence = Ia);
- develop an individualized plan of care in collaboration with the person (Level of Evidence = Ia);
- engage family (as appropriate) and promote social support for interventions (Level of Evidence = III); and
- evaluate the plan of care together with the person (and family) and revise as needed (Level of Evidence = V).

Level of Evidence: Ia, III, V
Quality of Evidence: Reviews = strong, moderate, and low; guidelines = strong; expert panel

Discussion of Evidence:

Adults at risk for falls and fall injuries need to be actively engaged in all aspects of their care. This includes assessments, and planning, implementing, and evaluating plans of care. Although the evidence regarding these actions is often specific to older adults, the expert panel suggests that efforts should be made to engage *all* individuals, regardless of their age, across the continuum of care. These principles are also aligned with the concept of person- and family-centred care.

Explore their knowledge and perceptions of risk, and their level of motivation to address risk

Evidence suggests that older adults identified as at risk for falls may not perceive themselves as "high risk" and may decline interventions (McInnes, Seers, & Tutton, 2011). Health-care providers may assess the person's subjective view of falls risk, including whether they are afraid of falling and how this fear affects their life (COT, 2015). A person's level of motivation, degree of engagement, and underlying beliefs about particular interventions should be determined to ascertain what changes the person is willing to make to prevent falls (COT, 2015; NICE, 2013). The expert panel recommends that motivational interviewing techniques may be used to gain an understanding of the person's understanding, perceptions, and motivation.

Communicate sensitively about risk and use positive messaging

It is important for health-care providers to recognize that the label "at risk" is associated with stigma, frailty, and loss of independence, and that the term should be used with caution (McInnes et al., 2011). Health-care providers should communicate sensitively and positively, and should phrase messaging about risk and injury carefully (COT, 2015; NICE, 2013). The benefits of interventions—such as maintaining or increasing independence, and improving mobility and active participation in life—should be emphasized when engaging adults (COT, 2015).

Discuss options for interventions and support self-management

People need the opportunity to determine which falls prevention interventions are most suitable for them (Turner et al., 2011). Findings suggest that overbearing or restrictive interventions are not popular with people and that constant vigilance for falls hazards is disempowering (Turner et al., 2011). A sense of control and self-management are highly valued (McInnes et al., 2011). Appropriate approaches may include collaborating with the person to determine the best ways to minimize risk and support realistic risk-taking (COT, 2015). Options for falls prevention interventions need to be discussed, and the person's perceptions about risk and their preferences should be given careful consideration (McInnes et al., 2011). This includes respecting the person's right to decline particular interventions.

Develop an individualized plan of care in collaboration with the person

The plan of care—that is, interventions implemented to prevent falls or reduce fall injuries—must be individualized for each adult to address risk factors for falls and fall injury (see **Recommendation 2.4** and **Appendix G**). All plans of care should be developed in collaboration with the person (and family, if appropriate). Health-care providers must consider particular characteristics of the individual that may influence the success of interventions. For people with dementia, it is important to acknowledge and accommodate individual differences and preferences (for example, acknowledging their personhood, recognizing existing capacity, and communicating effectively) to promote better engagement with falls prevention strategies (Meyer, Hill, Dow, Synnot, & Hill, 2015).

When seeking to prevent fractures among long-term-care residents and frail older adults, interventions should be tailored to the person, taking into consideration their level of risk, life expectancy, health status, and physical function (Crandall et al, 2016; Papaioannou et al., 2015).

Interventions that acknowledge and are tailored to a person's language and culture are more effective than those that are not. For example, fall prevention exercise classes may need to account for cultural clothing requirements and allow for gender segregation (Jang et al., 2016; NICE, 2013).

The person's ability to access interventions—in terms of cost and geographical location—should be considered when developing a plan of care. The expert panel identifies that some interventions may not be easily accessible to adults; for example, the cost of mobility aids may be prohibitive, and accessing cataract surgery may not be feasible for some adults as a result of where they live. Additional planning or support may be required to facilitate access or advocate for resources.

Engage family (as appropriate) and promote social support for falls interventions

Engaging the person's family and social networks may support falls prevention efforts (COT, 2015). For persons with dementia living in the community, involving caregivers and health-care providers is key to support uptake of falls prevention interventions (Meyer et al., 2015). Social support, such as advice and encouragement from health-care providers and family members, also helps promote adherence to interventions (Jang et al., 2016).

Evaluate the plan of care with the person (and family) and revise as needed

The expert panel recommends that health-care providers regularly evaluate the plan of care with the person and family (as appropriate). Health-care providers should determine how the person perceives the plan of care and the benefit of interventions. Revisions to the plan of care may be required and new interventions may be considered to address risk for falls or fall injuries. The frequency of monitoring and evaluating the plan of care will vary according to the setting and organizational policy. However, consider evaluation on admission, discharge, a significant change in status, or after a fall.

It should be noted that some interventions are not effective immediately (e.g., exercise programs) and that it may be difficult to assess the effectiveness of specific interventions, as falls are associated with multiple factors. In some cases, interventions may aim to minimize injury or reduce the number of times a person falls rather than eliminate falls completely.

Addititional Resources

For additional information to support this recommendation, refer to RNAO's (2015) BPG *Person- and Family-Centred Care* (RNAO.ca/bpg/guidelines/person-and-family-centred-care).

RECOMMENDATION 2.2:

Provide education to the person at risk for falls and fall injuries and their family (as appropriate) in conjunction with other falls prevention interventions (Level of Evidence = Ia). This includes providing information about falls risk, falls prevention, and interventions.

Ensure that the information is provided in a variety of formats and in the appropriate language (Level of Evidence = V).

Level of Evidence: Ia & V
Quality of Evidence: Reviews = strong, moderate, and low; guidelines = strong; expert panel

Discussion of Evidence:

The evidence is unclear regarding the effectiveness of education on reducing falls. However, education together with other falls prevention measures appears to contribute to falls reduction in hospitals (Hempel et al., 2013; Lee, Pritchard, McDermott, & Haines, 2014; Miake-Lye et al., 2013; Spoelstra, Given, & Given, 2012) and community settings (Chase, Mann, Wasek, & Arbesman, 2012). Although the effectiveness of education for at-risk adults is unclear, there are no known harms resulting from education and counselling (NICE, 2013; U.S. Preventive Services Task Force, 2012).

Providing educational materials without other interventions has not proven effective at reducing falls (Gillespie et al., 2012). Similarly, providing education without other interventions is insufficient for behaviour change in people with dementia (Meyer et al., 2015). People with cognitive impairments may require additional accommodations and focused interventions to support learning; for example, simple statements, visual cues, and frequent reminders (Meyer et al., 2015).

Education should be offered in different formats, including oral, written, and electronic (e.g., web resources, printed materials, etc.), and in a language that the person understands (COT, 2015; NICE, 2013). Further, health-care providers should share their knowledge and understanding of falls prevention and injury reduction strategies, and provide information that aligns with the person's lifestyle, preferences, and particular risk factors (COT, 2015). The expert panel recommends that health-care providers use motivational interviewing strategies to complement the education focused on behaviour change. In addition, they should use their clinical judgment to determine which educational topics are relevant. Family members should be engaged, as appropriate. **Figure 2** provides a list of education topics (the list is not exhaustive) recommended in the literature and by the expert panel.

Figure 2: Possible Education Topics

- How to prevent falls and reduce fall injuries
- How risk factors or health conditions contribute to risk for falls or injury (e.g., medications that cause dizziness or affect bleeding risk)*
- The behavioural risk factors that contribute to falls (e.g., hurrying)
- The physical and psychological benefits of modifying falls risk
- How to stay motivated (e.g., for exercise)
- The rationale behind an intervention (e.g., how hip protectors[G] can protect from fall injuries)
- How to use equipment for preventing falls or reducing injuries, if applicable (e.g., use of assistive devices)
- How to implement safe transfers*
- How to access centralized repository and/or resources for advice and assistance (e.g., where to get information about home safety, exercise programs, information on nutrition, etc.)
- How to cope and what to do in the event of a fall
- How to get up from a fall*
- Insights or knowledge gained from past falls*
- The adjustments that can be made to the physical environment to help reduce the risk for falls*

Sources: Boelens et al., 2013; Korall et al., 2015; NICE, 2013.
* Provided by the expert panel.

Addititional Resources

For additional information about educational approaches, refer to RNAO's (2012) BPG, *Facilitating Client Centered Learning* (RNAO.ca/bpg/guidelines/facilitating-client-centred-learning).

RECOMMENDATION 2.3:

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.

Level of Evidence: V
Quality of Evidence: No evidence found; expert panel

Discussion of Evidence:

The expert panel recommends that health-care providers communicate the person's individual falls risk and related plan of care/interventions at all care transitions. As outlined in RNAO's (2014) BPG *Care Transitions*, this involves taking actions to ensure "safe and effective coordination and continuity of care as clients experience a change in health status, care needs, health-care providers or location (within, between or across settings)" (Coleman & Boult, as cited in RNAO, 2014, p. 66). Lack of communication at care transitions could increase a person's risk for falls and fall injury. Whenever possible, information should be communicated to the most responsible health-care provider(s) or the interprofessional team at the setting where the person usually receives care (if applicable), to ensure appropriate

follow-up. The literature is unclear regarding whether or not a visual indicator (e.g., a logo, symbol, or wrist band) of falls risk is effective as a means of communicating falls risk. Further research is needed on this topic.

The expert panel outlines the following examples of times where health-care providers may need to be more vigilant:

- transfer to, or discharge from, an emergency department, especially if the visit to the emergency department was related to a fall or a condition associated with an increased falls risk;
- transfer from one unit to another;
- transfer from one health-care setting to another;
- transfer from one health-care provider and another;
- transit to or from diagnostic tests (e.g., radiology, ultrasound); and
- discharge home or to a long-term-care setting.

To reduce the risk of falls, it is recommended that health-care providers ensure that pertinent information is promptly shared with the next responsible health-care provider or the interprofessional team. This should include, at minimum, the following:

- the person's risk factors/health conditions;
- the person's history of falls;
- situational or environmental factors that may temporarily increase falls risk (e.g., eyeglasses not currently available, recent administration of sedating medication, catheter tubing);
- plans of care to reduce risk; and
- the person's preferences with regard to interventions.

In some circumstances (e.g., when a person is in transit for diagnostic tests), the information will need to be abbreviated.

Addititional Resources

For additional information on care transitions, see RNAO's (2014) BPG *Care Transitions* (RNAO.ca/bpg/guidelines/care-transitions).

RECOMMENDATION 2.4:

Implement a combination of interventions tailored to the person and the health-care setting to prevent falls or fall injuries.

Level of Evidence: Ia
Quality of Evidence: Reviews = strong, moderate, and low; guidelines = strong

Discussion of Evidence:

People at risk for falls and fall injuries should be offered a combination of interventions that target their particular risk factors and health conditions, focusing on those factors that are modifiable (see **Recommendation 1.2a** and **Appendix E** for more information). Little evidence was found regarding the most effective combinations or components of interventions in community (V. A. Goodwin et al., 2014; Turner et al., 2011), hospital (Changqing et al., 2015; Cumbler

et al., 2013), or long-term-care settings (Balzer, Bremer, Schramm, Luhmann, & Raspe, 2012; Papaioannou et al., 2015; Vlaeyen et al., 2015). A range of interventions have been studied with varying degrees of effectiveness; these are outlined in **Appendix G**.

The majority of interventions listed in **Appendix G** are referred to as falls prevention interventions and do not specify outcomes associated with injury reduction. However, interventions to prevent falls should prevent fall injuries. Reducing injuries is an important priority in health-care settings, especially among people who have a history of repeated falls. Further research is needed to explore interventions that may be used specifically to prevent injury (see **Research Gaps and Future Implications)**. Interventions that explicitly address injury reduction include exercise (see **Recommendation 2.5**), vitamin D supplementation (see **Recommendation 2.7**), and hip protectors (see **Recommendation 2.9**).

Health-care providers should select evidence-based interventions that are appropriate for the health-care setting. It is important to consider feasibility, particularly when a person is receiving home care. See **Appendix G** for a summary of evidence on interventions, which includes information on applicability to different health-care settings, where available.

Community

In community settings, a combination of interventions have been shown to reduce falls (Gillespie et al., 2012; Stubbs, Brefka, & Denkinger, 2015; Turner et al., 2011). However, the benefits are limited when interventions are targeted to individual risks identified from the multifactorial assessment (U.S. Preventive Services Task Force, 2012). V. A. Goodwin et al. (2014) reported that 'multiple component interventions' that were not based on an individualized risk assessment were effective at reducing falls but not related injuries. These multiple component interventions appear to be more effective for health-care settings with limited resources and specific populations (V. A. Goodwin et al., 2014). Little evidence was found on the specific aspects of multiple component interventions, though exercise was frequently highlighted in 12 of 14 of included studies.

Hospital

Health-care providers should offer a combination of interventions, personalized to the individual, to prevent falls. Several low-quality reviews indicate positive outcomes related to falls when a combination of interventions are used in hospitals to address falls risk (Choi, Lawler, Boenecke, Ponatoski, & Zimring, 2011; Cumbler et al., 2013; Halm & Quigley, 2011; Hempel et al., 2013; Miake-Lye et al., 2013; Spoelstra et al., 2012; Stubbs, Denkinger, Brefka, & Dallmeier, 2015). Interventions that address risk factors that can be treated, improved, or managed while the person is in hospital are recommended (NICE, 2013).

Complex interventions delivered by interprofessional teams had minimal impact on fall rates in one review. Several confounding variables were identified including poor compliance, insufficient time for falls prevention and care planning, and illness acuity. The choice of interventions and the determination of persons at risk were based on simple tools and flawed risk stratification processes in the samples under investigation (DiBardino et al., 2012). See **Research Gaps and Future Implications**.

Long-Term Care

In long-term-care settings, a combination of interventions individualized to the person and delivered by an interprofessional team was found to be effective at reducing the number of falls and recurrent falls (Vlaeyen et al., 2015). Individualized interventions appear to have even greater benefits for people living in long-term care who have dementia, compared to those who do not (Vlaeyen et al., 2015).

Other literature suggests that the overall benefit of individualized interventions was modest (Neyens et al., 2011; Papaioannou et al., 2015; Stubbs, Denkinger, et al., 2015). Evidence on fracture prevention indicates that the reduction in falls is minimal, and that the implementation of individualized interventions is costly. However, even a small reduction in falls can reduce significant harms (e.g., fractures and related consequences) and is therefore advantageous (Papaioannou et al., 2015). Although a large magnitude of effect was not found, it is recommended that health-care providers individualize interventions to prevent falls and fall injuries.

RECOMMENDATION 2.5:

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.

Level of Evidence: Ia
Quality of Evidence: Reviews= strong, moderate, and low; guidelines = strong

Discussion of Evidence:

Exercise interventions and physical training[G] improve strength and balance, and reduce falls and fall injuries, particularly fractures (El-Khoury, Cassou, Charles, & Dargent-Molina, 2013; Gillespie et al., 2012; NICE, 2013; Stubbs, Brefka, et al., 2015; U.S. Preventive Services Task Force, 2012). The majority of evidence focused on exercise interventions among older adults (or known high-risk populations, such as individuals with Parkinson's disease) in community settings. In order to determine potential interventions, health-care providers should be aware of the various types of exercise interventions found to benefit people at risk for falls. **Appendix H** summarizes a range of exercise and physical training interventions, including core strength, stepping, interactive cognitive–motor, and perturbation-based balance training, Pilates, exergaming, falls prevention exercise programs, foot and ankle exercises, individualized exercise, tai chi, and yoga.

The following considerations should guide health-care providers when recommending exercise and physical training interventions:

- The type of activity or exercise should be meaningful to the person, aligned with their preferences (COT, 2015), and culturally appropriate (Jang et al., 2016).
- The activity or exercise should be adjusted to the person's abilities (DiBardino et al., 2012), including their cognitive abilities (Chan et al., 2015) and fear of falling (Lach & Parsons, 2013).
- Caution should be taken when recommending exercise to those at high risk of fracture (Papaioannou et al., 2015).
- For some people, the value of exercising may outweigh the risk of falling (Papaioannou et al., 2015).
- Exercise has numerous other benefits, such as reducing functional decline and fear of falling, and improving socialization, self-esteem (Vieira, Palmer, & Chaves, 2016), quality of life (Martin et al., 2013), and general physical and mental health (NICE, 2013).

To promote adherence and effectiveness, exercise interventions should be individualized (Mulligan, Tschoepe, & Smith, 2014; NICE, 2013) and supported by an exercise professional, such as a physical therapist (Martin et al., 2013; Mulligan et al., 2014; NICE, 2013). This is particularly evident for adults at high risk for falls with physical co-morbidities (Stubbs, Brefka, et al., 2015).

Community

Comprehensive exercise programs delivered in groups or at the person's home that focus on falls prevention, muscle strengthening, and balance have been shown to effectively address risk factors, prevent falls, and reduce injury from falls (El-Khoury et al., 2013; Gillespie et al., 2012; NICE, 2013; Stubbs, Brefka, et al., 2015; U.S. Preventive Services Task Force, 2012). The protective effects of exercise are most beneficial for severe fall injuries, such as fractures (El-Khoury et al., 2013). Individuals with a history of recurrent falls and/or balance and gait deficits may benefit the most from exercise (NICE, 2013).

Hospital

Evidence on the effectiveness of exercise specific to preventing falls in hospital settings was not found; however, some interventions in **Appendix H** may be appropriate for certain individuals, depending on the type of hospital setting and resources available. Health-care providers should aim to maintain a person's physical activity within their ability. The expert panel recommends that maintaining mobility (e.g., early activation) has numerous benefits, including reducing the risk for increased frailty, functional decline, and falls.

Long-Term Care

Overall, exercise is recommended in long-term care. Balance, strength, and functional training exercises are recommended for those *not at high risk for fracture*. For people with a high risk of fracture, these exercises are appropriate only as part of a multifactorial approach to preventing falls (Papaioannou et al., 2015). Other literature suggests that exercise with a balance component was most effective when combined with other types of exercise (Silva, Eslick, & Duque, 2013). Exercise should be offered concurrently with other prevention strategies (NICE, 2013).

Benefits for Specific Populations

The literature indicates that exercise interventions are beneficial for adults with Parkinson's disease (Allen, Sherrington, Paul, & Canning, 2011; Mansfield, Wong, Bryce, Knorr, & Patterson, 2015; Shen, Wong-Yu, & Mak, 2016), multiple sclerosis (Sosnoff & Sung, 2015; Gunn, Markevics, Haas, Marsden, & Freeman, 2015), visual impairments (Gleeson, Sherrington, & Keay, 2014), and those aged 40 to 65 years (Ferreira et al., 2012). Positive outcomes were also reported among people with osteoarthritis of the knee (Mat, Tan, Kamaruzzaman, & Ng, 2015) and frail older adults (Cadore, Rodriguez-Manas, Sinclair, & Izquierdo, 2013). There is insufficient evidence to demonstrate that exercise prevents or reduces falls after a person is discharged from rehabilitation following a stroke (Verheyden et al., 2013). For people with cognitive impairment, exercise interventions have been shown to have a positive effect on preventing falls (Burton et al., 2015; Chan et al., 2015; Guo, Tsai, Liao, Tu, & Huang, 2014); however, in other reviews the evidence was inconsistent (Booth, Logan, Harwood, & Hood, 2015; Jensen & Padilla, 2011).

Activity and Exercise Guidelines

In long-term care settings, multi-component exercise programs were offered two to three times per week for more than six months to maintain or improve strength and balance (Silva et al., 2013). Similarly, in the community setting, exercise must be ongoing and of sufficient frequency to be effective (Sherrington, Tiedemann, Fairhall, Close, & Lord, 2011).

Additional Resources

See **Appendix H** for additional information on exercise that is applicable to people at risk for falls or fall injuries.

RECOMMENDATION 2.6:

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 (Level of Evidence = Ia).

This includes the following actions:

- identify polypharmacy and medications that increase risk for falls (Level of Evidence = Ia);
- conduct a medication review, or refer to appropriate health-care provider and/or the prescriber (Level of Evidence = V); and
- monitor for side effects of medications known to contribute to risk for falls (Level of Evidence = Ia).

Level of Evidence: Ia & V
Quality of Evidence: Reviews = strong, moderate, and low; guidelines = strong

Discussion of Evidence:

Health-care providers should collaborate with prescribers (e.g., nurse practitioners, physicians) to identify polypharmacy or the use of high-risk medications, to review medications, and to identify side effects related to risk for falls. Though some literature suggests that medication discontinuation is not related to falls (Darowski & Whiting, 2011; U.S. Preventive Services Task Force, 2012; Zia, Kamaruzzaman, & Tan, 2015), other evidence supports reducing, gradually withdrawing, or discontinuing medications associated with risk for falls (Changqing et al., 2015; Gillespie et al., 2012; NICE, 2013) when the person's health condition or change in status allows. It is important that health-care providers consider risks versus benefits and avoid undertreatment (i.e., the therapeutic value of medications for disease management versus safe prescribing) when making decisions around medication use (Zia et al., 2015).

The STOPP/START criteria, a tool for addressing potentially inappropriate prescribing in older adults, appears to improve prescription practices and may reduce falls in hospital and long-term-care settings (Hill-Taylor et al., 2016). The Beers criteria can also be used to support a medication review for residents in long-term care (Papaioannou et al., 2015).

Identify polypharmacy and medications that increase risk for falls

Polypharmacy has been highlighted in several reviews as a risk factor for falls (Ambrose et al., 2015; Ambrose et al., 2013; Callis, 2016; Zia et al., 2015). Certain classes of medications, such as psychotropic drugs (e.g., medications for improving sleep, reducing anxiety, and treating depression) increase the risk for falls (Bunn et al., 2014; Changqing et al., 2015; Vieira et al., 2011). Health-care providers should be particularly vigilant around reducing the risk for falls when a person is taking multiple medications or certain classes of medications.

Conduct a medication review, or refer to appropriate health-care provider and/or the prescriber

Medication reviews should be conducted to help reduce the risk for falls (NICE 2013; Papaioannou et al., 2015). Although one review does not demonstrate the benefit of medication review on falls prevention among older adults in the community setting (Gillespie et al., 2012), the expert panel recommends that this is prudent practice across health-care settings. A medication review should be conducted by a health-care provider with the appropriate knowledge and

skills, and may require referral to a pharmacist or the prescriber, or input from specialists (Changqing et al., 2015; NICE, 2013). The literature does not specifically outline how often a medication review should be conducted, and this may vary according to the health-care setting. The expert panel recommends the following timeframes for a medication review:

- transitions in care (admission, transfer, discharge);
- following a fall;
- following a significant change in condition; and
- when new medications are prescribed.

Monitor for side effects of medications known to contribute to risk for falls

Health-care providers should be vigilant for medication side effects that may contribute to an increased risk for falls, such as postural hypotension (Changqing et al., 2015; de Groot et al., 2013). The expert panel suggests that this should occur on an ongoing basis.

Addititional Resources

For more information and resources on optimizing medication effectiveness and reducing, withdrawing, or discontinuing medications, refer to **Appendix I**.

RECOMMENDATION 2.7:

Refer adults at risk for falls or fall injuries to the appropriate health-care provider for advice about vitamin D supplementation.

Level of Evidence: V
Quality of Evidence: Reviews = strong and moderate; guidelines = strong and moderate

Discussion of Evidence:

The evidence on vitamin D use specifically examined falls and fracture prevention. Overall, the evidence for the use of vitamin D is mixed, and there is evidence that vitamin D use in fall or fracture prevention is inconsistent and inconclusive (Gillespie et al., 2012; NICE, 2013; Stubbs, Brefka, et al., 2015; Zheng, Cui, Hong, & Yao, 2015). However, considerable evidence was found supporting the use of vitamin D for falls prevention in the community (Gillespie et al., 2012; U.S. Preventive Services Task Force, 2012; Verheyden et al., 2013) and for reducing fractures in long-term care (Gillespie et al., 2012; Murad et al., 2011; NICE, 2013; Papaioannou et al., 2015; Stubbs, Brefka, et al., 2015; Verheyden et al., 2013; Workgroup of the Consensus Conference on Vitamin D for the Prevention of Falls and their Consequences, 2014).

Vitamin D may be most beneficial in people who have vitamin D deficiency and people living in long-term care (Gillespie et al., 2012; Murad et al., 2011; Papaioannou et al., 2015; Stubbs, Brefka, et al., 2015; Verheyden et al., 2013; Workgroup of the Consensus Conference on Vitamin D for the Prevention of Falls and their Consequences, 2014). There is some literature that recommends vitamin D with calcium (Papaioannou et al., 2015; Stubbs, Brefka, et al., 2015; Murad, 2011; Workgroup of the Consensus Conference on Vitamin D for the Prevention of Falls and their Consequences, 2014); however, possible side effects of calcium should be considered (Stubbs, 2015).

Given the mixed evidence regarding vitamin D supplementation for falls and fracture prevention, the expert panel recommends that people at risk for falls or fall injuries be referred to the appropriate health-care provider (e.g., nurse

practitioner, physician, dietitian) to discuss vitamin D supplementation. Although vitamin D is available without a prescription, the health-care provider can support informed decision-making and advise on therapeutic dosing.

Health-care providers with the appropriate expertise may refer to the following guidelines for detailed information on vitamin D, including benefits and dosage:

- Recommendations for Preventing Fracture in Long-Term Care (Papaioannou et al., 2015)
- American Geriatrics Society Consensus Statement: Vitamin D Prevention of Falls and their Consequences in Older Adults (Workgroup of the Consensus Conference on Vitamin D for the Prevention of Falls and their Consequences, 2014).

RECOMMENDATION 2.8:

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.

Level of Evidence: V
Quality of Evidence: Guideline = strong and moderate; expert panel

Discussion of Evidence:

The expert panel recommends that health-care providers encourage all adults at risk for falls or fall injuries—and those at risk for fractures, in particular—to optimize their bone health.

Dietary Interventions

Dietary interventions may include optimizing calcium intake (Papaioannou et al., 2015; Workgroup of the Consensus Conference on Vitamin D for the Prevention of Falls and their Consequences, 2014) and strategies to achieve sufficient absorption of vitamin D (Workgroup of the Consensus Conference on Vitamin D for the Prevention of Falls and their Consequences, 2014).

Nutritional information is readily available to nurses, other health-care providers, and the public, but some individuals may require a referral for nutrition counselling. Registered dietitians, for example, can provide more in-depth information on optimizing vitamin D and calcium, and on other issues associated with risk for falls or fall injuries, such as malnutrition and sarcopenia[G].

Other Strategies

Exercise focused on building and maintaining bone strength and density is recommended by the expert panel. Health-care providers with knowledge of exercise and bone health can provide guidance and support for the appropriate types of exercise. This is important for those at high risk of fracture (Papaioannou et al., 2015). See **Recommendation 2.5** for additional information on exercise to prevent falls and reduce fracture.

People with osteoporosis and other diseases that affect bone health, or those who have sustained a fracture, should be advised to consult a specialist for additional interventions or medications (e.g., bisphosphonates) appropriate for their particular heath condition.

Addititional Resources

For a list of resources including those that offer additional information on on nutrition and bone health, refer to **Appendix L**.

RECOMMENDATION 2.9:

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.

Level of Evidence: Ia
Quality of Evidence: Reviews = moderate and low; guideline = strong

Discussion of Evidence:

Hip protectors are hard plastic shields or foam pads used to absorb energy from a fall or shunt the force of impact from a fall to avoid serious consequences, including fracture and associated pain, loss of mobility, and death (Papaioannou et al., 2015; Santesso, Carrasco-Labra, & Brignardello-Petersen, 2014).

Reviews focused on long-term-care settings report mixed findings (Combes & Price, 2014) or small benefit from the use of hip protectors for reducing hip fracture (i.e., protecting approximately 11 out of 1,000 people) (Santesso et al., 2014). These results are believed to be associated with the challenges of acceptance and adherence (Combes & Price, 2014; Santesso et al., 2014; Wallis & Campbell, 2011). Weighing study outcomes, hip protectors likely reduce the risk of hip fracture among older adults in long-term-care settings, without increasing the risk for falls (Santesso et al., 2014). Such devices are appropriate for mobile people at high risk for fracture, such as those with a positive history of fracture or osteoporosis (Neyens et al., 2011; NICE, 2013; Papaioannou et al., 2015; Wallis & Campbell, 2011).

See **Appendix E** for information on fracture risk.

Use of Hip Protectors in Other Settings

There is minimal evidence on the use of hip protectors for populations other than older adults in long-term-care settings. One review reported that hip protectors had little or no effect among community-dwelling older adults (Santesso et al., 2014), and no evidence was found for the use of hip protectors in hospital settings. Despite the lack of evidence, the expert panel suggests that some individuals may consider hip protectors—for example, those in hospital at risk for hip fracture, or those in the community with osteoporosis engaging in higher-risk activities (e.g., sports, walking on icy sidewalks, etc.).

Considerations

The potential benefits and harms should be considered when deciding whether hip protectors are appropriate for a particular individual. Health-care providers are encouraged to discuss these factors with adults at risk for hip fracture (or their substitute decision-maker). Health-care providers should also be aware of barriers to adherence, including at the organizational level. These are summarized in **Table 4**.

Further research is needed to determine if hip protector product design influences acceptance and adherence (Santesso et al., 2014). The expert panel notes that new hip protector technologies are under development, which could reduce barriers and increase use.

Table 4: Hip Protectors—Potential Benefits, Harms, and Barriers to Adherence

Potential Benefits	■ Potential reduction of sustaining a hip fracture if worn appropriately and worn at the time of a fall* ■ Potential avoidance of serious consequences of hip fractures, including pain, loss of mobility, and death (Papaioannou et al., 2015) ■ Potential reduction in fear related to fracture*
Potential Harms	■ Slight increase in the risk of pelvic fractures (Santesso et al., 2014) ■ Skin irritation (Combes & Price, 2014; Santesso et al., 2014)
Barriers to Adherence	■ Staff attitudes (negative perceptions about hip protectors or lack of education) (Combes & Price, 2014; Korall et al., 2015) ■ Product design issues, such as: discomfort, takes time/assistance to put on (Combes & Price, 2014; Korall et al., 2015; Santesso et al., 2014), bulky (affects mobility)*, resizing may be required with weight loss/gain* ■ Systemic barriers (e.g., lack of facility commitment, staff shortages) (Korall et al., 2015) ■ Urinary incontinence and physical difficulties/illness (Santesso et al., 2014) ■ Cost/affordability* ■ Concerns about dignity and appearance (e.g., may be noticed through clothes/make a person look overweight)* ■ Agitation in people with cognitive impairment*

* Provided by the expert panel.

3.0 RESEARCH QUESTION #3:
What interventions or processes should occur immediately following a fall?

RECOMMENDATION 3.1:

After a person falls, provide the following interventions:

- conduct a physical examination to assess for injury and to determine the severity of any fall injuries (Level of Evidence = III);
- provide appropriate treatment and care (Level of Evidence = V);
- monitor for injuries that may not be immediately apparent (Level of Evidence = V);
- conduct a post-fall assessment to determine factors that contributed to the fall (Level of Evidence = III);
- collaborate with the person and the interprofessional team to conduct further assessments and determine appropriate interventions (Level of Evidence = V); and
- refer the person to the appropriate health-care provider(s) for physical rehabilitation and/or to support psychological well-being (as needed) (Level of Evidence = III).

Level of Evidence: III & V
Quality of Evidence: Review = low; guideline= strong; expert panel

Discussion of Evidence:

A comprehensive response is required following a fall. According to the expert panel, post-fall processes can reduce the negative consequences of falls, inform interventions to prevent or reduce future falls, and lead to quality improvement for health-care organizations.

Conduct a physical examination to assess for injury and to determine the severity of any fall injuries

Beauchet, Dubost, Revel Delhom, Berrut, & Belmin (2011) recommend systematically assessing the severity of fall injuries[G]. This includes moderate or severe injuries, such as fractures, dislocations, intercranial bleeds, and deep lacerations. For people who have been unable to get off the floor and have been resting on the ground for a prolonged period of time (e.g., over an hour), health-care providers should assess for consequences such as hypothermia, pressure injuries, and dehydration (Beauchet, Dubost et al., 2011). Various scales are used to determine fall severity and should be used consistently within an organization. When a health-care provider is present at the time of a fall or shortly thereafter, the expert panel recommends that a physical examination be conducted before moving the person, to avoid exacerbating any injuries.

Diagnostic tests may be required to complete a post-fall assessment. Examples include x-rays for suspected fracture, electrocardiograms for those who experienced dizziness before the fall, blood glucose testing for those with diabetes, or cerebral imaging, if indicated. Clinical re-evaluation within a week after a fall is recommended (Beauchet, Dubost et al., 2011).

Provide appropriate treatment and care

Following an assessment, and if it is safe to do so, the expert panel recommends that the person may be carefully assisted off the floor (with transfer equipment, if available). People should be assessed and treated for complications resulting from the fall, such as reduced physical function, psychological side-effects (including fear of falling), or

changes in cognition (Beauchet, Dubost et al., 2011). The timeliness of such treatment will depend on the circumstances of the fall (e.g., if the health-care provider was present at the time of the fall or learns about it several days later). Following treatment for injury, the expert panel suggests that health-care providers follow organizational procedures such as documentation, informing family, and completing incident reports.

Monitor for injuries that may not be immediately apparent

According to the expert panel, some injuries may not be apparent immediately following a fall. In some cases, close observation of emerging injuries may be prudent (e.g., if a head injury is suspected). Examples of injuries that may not be immediately apparent include soft tissue injuries or subdural hematoma. Further research is needed in this area to determine appropriate post-fall monitoring. Protocols for monitoring emerging injuries should be determined by the health-care organization.

Conduct a post-fall assessment to determine factors that contributed to the fall

A post-fall assessment is used to determine factors that contributed to the fall and to inform strategies to prevent future falls. This can help prevent both the same and other individuals from falling in the future (e.g., if the assessment determines root causes that may require systemic changes within the organization).

Acute medical conditions (e.g., syncope, hypoglycemia, stroke, heart failure) that may have precipitated a fall should be investigated and treated. Other precipitating factors may include the person's actions at the time of the fall (e.g., rushing) or environmental conditions (e.g., slippery floor) (Beauchet, Dubost et al., 2011). A post-fall assessment can help identify underlying causes and contributing factors that are not always obvious. Family members or others present at the time of a fall may also provide important insights.

The expert panel supports a post-fall huddle, which involves members of the interprofessional team, as an effective approach to understanding the factors contributing to a fall in many health-care settings.

Collaborate with the person and the interprofessional team to conduct further assessments and determine appropriate interventions

Following a fall, the person should be offered an assessment with members of the interprofessional team to address future falls risk and implement or adjust interventions to address falls risk (NICE, 2013). See **Recommendation 1.2a** for more information about comprehensive assessments.

Refer the person to the appropriate health-care providers(s) for physical rehabilitation and/or to support psychological well-being (as needed)

The person may need to be referred to one or more professionals for long-term treatment of physical and/or psychological effects, such as fear of falling or physical rehabilitation (Beauchet, Dubost et al., 2011). Such interventions should focus on promoting independence and restoring or optimizing the person's physical and psychological function (NICE, 2013). See **Recommendation 1.2b** for more information about referrals.

Additional Resources

For additional information and examples of post-fall assessments, refer to **Appendix J**.

Education Recommendations

4.0 RESEARCH QUESTION #4:

What content and educational strategies are necessary to effectively educate nurses and other health-care providers to prevent falls and injury from falls?

RECOMMENDATION 4.1:

Educational institutions incorporate content on falls prevention and injury reduction into health-care education and training programs.

Level of Evidence: V
Quality of Evidence: No evidence found; expert panel

Discussion of Evidence:

The expert panel recommends that health-care education and training programs (e.g., pre-licensure undergraduate programs) include specific content related to falls prevention and injury reduction. Entry-level education establishes foundational knowledge and skills that can be reinforced and augmented in health-care settings.

Curriculum content must be tailored to the scope of practice of the health-care provider, but should include, at minimum, the following content:

- the importance of falls prevention and injury reduction;
- risk factors and health conditions associated with an increased risk for falls and fall injuries (often multiple causes);
- the importance of an intra-/interprofessional team approach to falls prevention and injury reduction;
- universal falls precautions[G], including promoting safe mobility, transferring, bed rail use, and toileting;
- alternative approaches to the use of restraints;
- interprofessional care after a person falls (including post-fall procedures, team debriefing, etc.); and
- the importance of communicating falls risk and care plan/interventions at all care transitions.

It is recommended that falls prevention and injury reduction concepts be taught within the context of person- and family-centred care, effective care transitions, and intra-/interprofessional collaboration.

Additional Resources

For information on supporting the application of nursing knowledge in a variety of clinical learning environments, refer to RNAO's (2016) BPG *Practice Education in Nursing* (RNAO.ca/bpg/guidelines/practice-education-nursing).

For information on interprofessional care, see RNAO's (2013) BPG *Developing and Sustaining Interprofessional Health Care: Optimizing Patient, Organisational and System Outcomes* (RNAO.ca/bpg/guidelines/interprofessional-team-work-healthcare).

For information on intra-professional collaboration, see RNAO's (2016) BPG, *Intra-professional Collaborative Practice among Nurses* (RNAO.ca/bpg/guidelines/intra-professional-collaborative-practice-among-nurses).

RECOMMENDATION 4.2:

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.

Level of Evidence: Ia
Quality of Evidence: = Reviews = moderate and low; guideline = strong; expert panel

Discussion of Evidence:

Results of reviews conducted in community, hospital, and long-term-care settings indicate that staff education should be a *component* of falls prevention initiatives (V. Goodwin, Jones-Hughes, Thompson-Coon, Boddy, & Stein, 2011; Hempel et al., 2013; Low et al., 2015; Miake-Lye et al., 2013; Stalpers, de Brouwer, Kaljouw, & Schuurmans, 2015; Vlaeyen et al., 2015).

In the long-term-care setting, multifactorial falls prevention initiatives for older adults that included staff education reduced the number of falls and repeat falls (Vlaeyen et al., 2015). Similar findings were evident for adults in the community setting (V. Goodwin et al., 2011). However, when falls prevention education was provided in isolation, it was ineffective (Vlaeyen et al., 2015). Other research supports the use of staff education as an implementation strategy for existing falls prevention initiatives (Hempel et al., 2013; Low et al., 2015) to change existing staff practices (Low et al., 2015).

Falls prevention is a shared responsibility.

The expert panel asserts that falls prevention is *everybody's* responsibility within a health-care organization. Education should be provided organization-wide for all staff regarding their role related to preventing falls. Education involving a range of staff helps facilitate successful implementation of falls prevention initiatives and may contribute to a safety culture (Spoelstra et al., 2012). Falls prevention education is an important quality improvement strategy in health-care organizations. See **Recommendation 5.2** for more information on organizational-level strategies to support effective implementation.

Organization-wide staff education may include (but is not limited to) dietary aides, health-care aides, volunteers, housekeeping staff, porters, and administrators. Education should be appropriate to the health-care provider's scope of practice and their defined role. The literature does not specify education topics or the frequency of education. Continuing education is important to ensure staff have current information. The frequency of training will depend on the organization; training may be provided during orientation and periodically through refresher courses.

Nurses and other health-care providers responsible for implementing practice recommendations may require additional education (post-licensure) to support knowledge and skill attainment, and the implementation of best practices. The evidence does not outline specific content needed to prevent falls or fall injuries other than a knowledge of the factors most commonly associated with falls (COT, 2015; NICE, 2013; Rice, Ousley, & Sosnoff, 2015; Zhao & Kim, 2015). At minimum, the following education is recommended:

- factors associated with an increased risk of falls and fall injuries (see **Recommendation 1.1**, **Recommendation 1.2a**, and **Appendix E**);
- approaches and/or tools for identifying risk for falls and fall injuries (see **Recommendation 1.1**, **Recommendation 1.2a** and **Appendix F**);
- approaches to engage the adult at risk for falls (see **Recommendation 2.1**);
- approaches and interventions commonly used in health-care settings to prevent falls and fall injuries (for interventions, see **Recommendation 2.4** and **Appendix G**; for universal falls precautions, see **Recommendation 5.1**; and for rounding, see **Recommendation 5.3**); and
- policies, procedures, legislation, and documentation related to falls prevention and injury reduction (e.g., communication strategies, post-fall procedures) used within health-care settings (see **Recommendation 2.3** and **Recommendation 3.1**).

Additional Resources

For links to other resources that support this recommendation, see the Professional Education and Networking section in **Appendix L**.

Organization and Policy Recommendations

5.0 RESEARCH QUESTION #5:

What organizational policies and system-level supports are required to help prevent falls and injuries from falls among at-risk adults?

RECOMMENDATION 5.1:

To ensure a safe environment:

- implement universal falls precautions, and
- identify and modify equipment and other factors in the physical/structural environment that contribute to risk for falls and fall injuries.

Level of Evidence: Ia
Quality of Evidence: Reviews = low; guidelines = strong

Discussion of Evidence:

Universal falls precautions are interventions applied in health-care settings that benefit everyone. They are based on the premise that all people receiving health-care will benefit from addressing environmental and situational falls risk factors. Universal falls precautions are automatically applied for all people, regardless of whether or not they are deemed at risk for falls.

It is important to address environmental factors that increase the risk for falls (Choi et al., 2011; Giles, Stephenson, McArthur, & Aromataris, 2015; NICE, 2013; Papaioannou et al., 2015) and fractures (Papaioannou et al., 2015). For example, trip hazards, poor footwear, and the need for assistance with mobility (Ambrose et al, 2015; Ambrose et al., 2013; Boelens et al., 2013; Deandrea et al., 2013; Giles et al., 2015; Rice et al., 2015; Zhao & Kim, 2015) and deficits in the physical/structural environment (Ambrose et al., 2015; Ambrose et al., 2013; Rice et al., 2015; Zhao & Kim, 2015). Leaders within health-care organizations should take the initiative to identify and modify factors in the physical/structural environment, including equipment that could contribute to falls and fall injuries.

Below are examples of factors (not an exhaustive list) to consider in the physical/structural environment:

- appropriate flooring (e.g., vinyl flooring is preferred over carpet in geriatric rehabilitation hospitals);
- adequate lighting;
- appropriate furniture (e.g., appropriate chair heights, bed height, side rails; see **Appendix K**);
- safe, functional equipment (e.g., mechanical lift equipment, wheelchairs, bed type)*;
- floor plan (e.g., sufficient room to move and use walking aids);
- supports, such as hand holds and hand rails;
- unit layouts; and
- 'dementia-friendly' environments (Choi et al., 2011; Giles et al., 2015; NICE, 2013; Wallis & Campbell, 2011).

* Provided by the expert panel.

Applicability of Settings

The majority of evidence focused on addressing environmental and situational risk factors in hospitals or long-term-care settings. One common precaution is lowering the bottom rail (split rail). The expert panel suggests that universal falls precautions are important in any health-care setting where the organization is responsible for providing a safe environment. Some universal falls precautions may be applicable or beneficial when providing care in individuals' homes. It may fall under the auspices of a health-care organization to ensure that equipment provided in the person's home is safe and in good condition. It is unclear from the evidence, however, to what extent this recommendation applies to care provided in a person's home.

Additional Resources

For information and an example of universal falls precautions, see **Appendix K**.
For resources related to promoting a safe physical/structural environment, see **Appendix L**.

RECOMMENDATION 5.2:

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.

Level of Evidence: Ia
Quality of Evidence: Reviews = moderate and low; guideline = strong

Discussion of Evidence:

Implementation and sustainability of falls prevention initiatives are challenges across all sectors. Implementation science methods are effectively used in health-care organizations to promote the systematic uptake of best practices (see **Appendix B** for implementation science frameworks). The literature describes both barriers and facilitators to successful implementation. Organizational leaders, in collaboration with interprofessional teams, can consider these factors, as well as barriers unique to their setting, when planning and sustaining falls prevention initiatives.

Barriers in Community Settings

The following are barriers/challenges to the successful implementation of falls prevention initiatives in community settings:

- lack of communication/collaboration between professionals;
- no sense of urgency or motivation on the part of the person to change behaviours;
- under-qualified staff and staff turnover; and
- lack of financial resources or time required to support comprehensive assessments and individualized interventions (COT, 2015; V. Goodwin et al., 2011).

Some barriers and challenges may be addressed directly by the health-care provider (e.g., use motivational interviewing for people who aren't ready to change behaviours). Other factors would require support at the organization or system level—for example, ensuring staff are trained and qualified, or securing adequate funding for effective falls prevention interventions (e.g., for equipment, assistive devices, or to develop educational materials).

Barriers in Long-Term-Care Settings

Less evidence is available regarding factors that impede or support the success of falls prevention initiatives in long-term-care settings. One review highlights some of the barriers that impede practice change for a variety of resident-centred strategies, including falls prevention. These include:

- staffing issues, such as high turnover, absenteeism, and high workloads;
- lack of resources and funding to implement new practices;
- infrastructure and software difficulties; and
- other logistical challenges (Low et al., 2015).

Low et al. (2015) report that initiatives to change practice in long-term care are complex and that it is unclear which combination of components leads to positive change. Enablers and barriers should be identified and addressed to promote successful initiatives. Further research regarding the factors in long-term-care settings is needed to determine how to promote the success and sustainability of falls prevention initiatives in these settings.

Findings Specific to Hospital Settings

The evidence reviewed for hospital settings did not focus on barriers to implementation of falls prevention initiatives, but rather on factors associated with success. Little evidence was found that identified the specific factors that are most important for program success in hospital settings (Miake-Lye et al., 2013). However, the expert panel affirms that the content in **Table 5** is consistent with clinical experience and the concept of implementation science. **Table 5** summarizes evidence on supports and structures associated with successful implementation and sustainability of falls prevention initiatives.

Table 5: Supports and Structures Associated with Successful Implementation and Sustainability of Falls Prevention Initiatives in Hospitals

SUPPORT/ STRUCTURE	EVIDENCE
Leadership	■ Leadership support (Giles et al., 2015; Hempel et al., 2013; Miake-Lye et al., 2013)
Capacity and collaboration of staff and safety culture	■ Staff education/training, including creating a safety culture (Spoelstra et al., 2012) ■ Address negative or cynical attitudes about falls prevention (Miake-Lye et al., 2013) ■ Organization-wide training to educate staff about falls prevention to engage health-care workers (e.g., housekeeping, dietary, transport, therapists, etc.) (Spoelstra et al., 2012) ■ Higher levels of experience and education (Stalpers et al., 2015) ■ Collaborative relationships among professionals (Stalpers et al., 2015)
Staffing	■ Adequate staffing (Stalpers et al., 2015) ■ Ensure staff are dedicated and available to support interventions (DiBardino et al., 2012)
Engaging staff/ team approach	■ Engagement of front-line staff in program design (Giles et al., 2015; Miake-Lye et al., 2013) ■ Engage clinical staff as 'change champions' (Giles et al., 2015) ■ Guidance or governance of the prevention program by a multidisciplinary committee (Giles et al., 2015; Miake-Lye et al., 2013)
Feedback loops	■ Pilot-test interventions and continuous quality improvement (Giles et al., 2015; Hempel et al., 2013; Miake-Lye et al., 2013)
Auditing	■ Establish audit criteria for falls prevention that addresses the physical environment, the hospital culture and care processes, and the use of technology (Giles et al., 2015)
Charting systems	■ Embed interventions in the electronic medical record (DiBardino et al., 2012)
Data monitoring	■ Use information technology and data management systems to provide data about falls (Miake-Lye et al., 2013)

Organizational Approaches

The evidence from hospital settings proposes organizational approaches to support falls prevention and injury reduction initiatives. One approach includes addressing the physical environment, care processes, and culture-

and technology-related interventions (Choi et al., 2011). Another takes a systems approach that includes addressing the organization (e.g., operations, policies, and procedures), people (e.g., staff, caregivers, and patients), and the environment (Taylor & Hignett, 2016). Empirical testing and validation is required in this area.

Additional Resources

For additional information to support this recommendation, refer to the implementation science frameworks in **Appendix B**, and **Guideline Evaluation**.

RECOMMENDATION 5.3:

Implement rounding as a strategy to proactively meet the person's needs and prevent falls.

Level of Evidence: Ia
Quality of Evidence: Reviews = low

Discussion of Evidence:

Rounding, the act of checking in on patients in person on a regular basis (e.g., hourly) to proactively meet their needs, was found to contribute to reducing the number of falls in hospital settings (Hicks, 2015; Mitchell, Lavenberg, Trotta, & Umscheid, 2014). Rounding allows health-care providers to address individual needs that may contribute to falling—for example, by determining whether the person requires repositioning and whether belongings are within reach, by assessing the person's pain, and assisting with toileting if necessary. It also ensures that the environment is checked regularly for safety issues.

Regular rounding can be considered an approach for comprehensive care and has other potential benefits, such as reduced pressure injuries (Hicks, 2015), reduced call-light use, improved patient satisfaction, and improved patient perception of staff responsiveness to needs (Mitchell et al., 2014). However, as it can potentially disrupt sleep or meals (Manojlovich, Lee, & Lauseng, 2016), efforts should be made to address possible unintended negative effects.

It is important to maintain a regular schedule for rounding in order to establish a trusting relationship between the person and the interprofessional team (Manojlovich et al., 2016). The decision to implement rounding should be considered at an organizational level to ensure alignment with policies and procedures, staff training, and compliance.

Although there was no evidence to support rounding except in the hospital setting, the expert panel suggests that this practice may benefit long-term-care settings where proactively addressing residents' needs on a regular basis could decrease their risk for falling.

The expert panel advises that variations in available resources and differences in organizations' structures may affect the frequency of rounding. Evidence in hospital settings supports rounding on an hourly basis (Hicks, 2015). The expert panel suggests that organizations may round more frequently (depending on patient needs) or less frequently (depending on resources).

Research Gaps and Future Implications

The RNAO Best Practice Guideline Program Team and expert panel identified the priority areas for future research outlined in **Table 6**. Studies conducted in these areas would provide further evidence to support falls prevention and falls-related injury reduction in adults. The list is not exhaustive; other areas of research may be required.

Table 6: Priority Research Areas for Each Research Question

RESEARCH QUESTION	PRIORITY RESEARCH AREA
Research Question #1: What are the most effective ways to identify adults at risk for falls or for injury due to falls?	■ Identifying factors or health conditions that increase the risk for fall injury ■ Effectiveness and feasibility of falls risk screening tools empirically tested across all health-care settings (e.g., effectiveness in hospital, long-term care, and community care) ■ Approaches for identifying risk for falls and fall injuries in adults under age 65 ■ Effectiveness of a visual identifier to communicate risk for falls or fall injury
Research Question #2: What interventions are effective in preventing falls and reducing the risk for falls or falls-related injury among at-risk adults?	■ Effectiveness of falls prevention interventions (or a combination of interventions) that can be applied universally to individuals with certain health conditions ■ Effectiveness of interventions to prevent or reduce injuries from falls ■ Comparing the effectiveness of two or more injury prevention interventions to clarify those that demonstrate the best person, family, and provider outcomes ■ Effectiveness of interventions to prevent falls or reduce falls-related injury in specific populations, including but not limited to: □ people with dementia or cognitive impairment □ people who have incontinence □ people with mental health conditions □ people who have had a stroke □ adults under age 65 ■ Effectiveness of interventions to prevent falls or reduce falls-related injury in specific health-care settings, including: □ emergency departments □ home care □ ambulatory settings or settings where people at risk for falls are seen for short time periods

RESEARCH QUESTION	PRIORITY RESEARCH AREA
	■ Effectiveness of specific interventions to prevent falls or reduce falls-related injury, including: □ effectiveness of technologies (e.g., alarms) for falls prevention □ effectiveness of medication reviews for falls prevention □ effectiveness of hip protector use in settings other than long-term care □ effectiveness of side rails designed to prevent falls □ effectiveness of other protective equipment to reduce injuries (e.g., helmets, floor mats, low height beds)
Research Question #3: What interventions or processes should occur immediately following a fall?	■ Identifying assessments and processes that should occur immediately following a fall and have demonstrated improved patient outcomes ■ Effectiveness, feasibility, and provider satisfaction of post-fall documentation systems and protocols
Research Question #4: What content and educational strategies are necessary to effectively educate nurses and other health-care providers to prevent falls and injury from falls?	■ Effective models for educating health-care providers to prevent falls and reduce falls-related injury ■ Educational and professional development approaches and content that demonstrate improved provider and patient outcomes (e.g., falls prevention, injury reduction) ■ Effectiveness of interprofessional educational strategies and approaches to mentor staff ■ Longitudinal effects of health-care-provider education on other measures of patient/resident outcomes (e.g., shorter length of stay, reduced readmissions)
Research Question #5: What organiza-tional policies and sys-tem-level supports are required to help pre-vent falls and injuries from falls among at-risk adults?	■ Factors that influence the success of falls prevention initiatives (all health-care settings) ■ Effective models that provide a framework for structuring falls prevention initiatives (all health-care settings) ■ Identification of systemic (organizational and societal) factors that contribute to falls ■ Effective approaches for conducting comprehensive falls investi-gations to determine causes (and not risks) for falling, leading to targeted interventions ■ Feasibility of falls prevention programs implemented at the health-system level and their long-term impacts ■ Feasibility of falls prevention programs implemented in settings with limited resources (e.g., rural and remote locations)

Implementation Strategies

Implementing guidelines at the point of care is multi-faceted and challenging; it takes more than awareness and distribution of guidelines for practice to change. Guidelines must be adapted for each practice setting in a systematic and participatory way, to ensure recommendations fit the local context (Harrison, Graham, Fervers, & van den Hoek, 2013). The RNAO *Toolkit: Implementation of Best Practice Guidelines* (2012) provides an evidence-informed process for doing this. It can be downloaded at RNAO.ca/bpg/resources/toolkit-implementation-best-practice-guidelines-second-edition

The *Toolkit* is based on emerging evidence that successful uptake of best practice in health care is more likely when:

- leaders at all levels are committed to supporting guideline implementation;
- guidelines are selected for implementation through a systematic, participatory process;
- stakeholders for whom the guidelines are relevant are identified and engaged in the implementation;
- environmental readiness for implementing guidelines is assessed;
- the guideline is tailored to the local context;
- barriers and facilitators to using the guideline are assessed and addressed;
- interventions to promote use of the guideline are selected;
- use of the guideline is systematically monitored and sustained;
- evaluation of the guideline's impact is embedded in the process; and
- there are adequate resources to complete all aspects of the implementation.

The *Toolkit* uses the "Knowledge-to-Action" framework (Straus, Tetroe, Graham, Zwarenstein, & Bhattacharyya, 2009) to demonstrate the process steps required for knowledge inquiry and synthesis (see **Figure 3**). It also guides the adaptation of the new knowledge to the local context and implementation. This framework suggests identifying and using knowledge tools, such as guidelines, to identify gaps and to begin the process of tailoring the new knowledge to local settings.

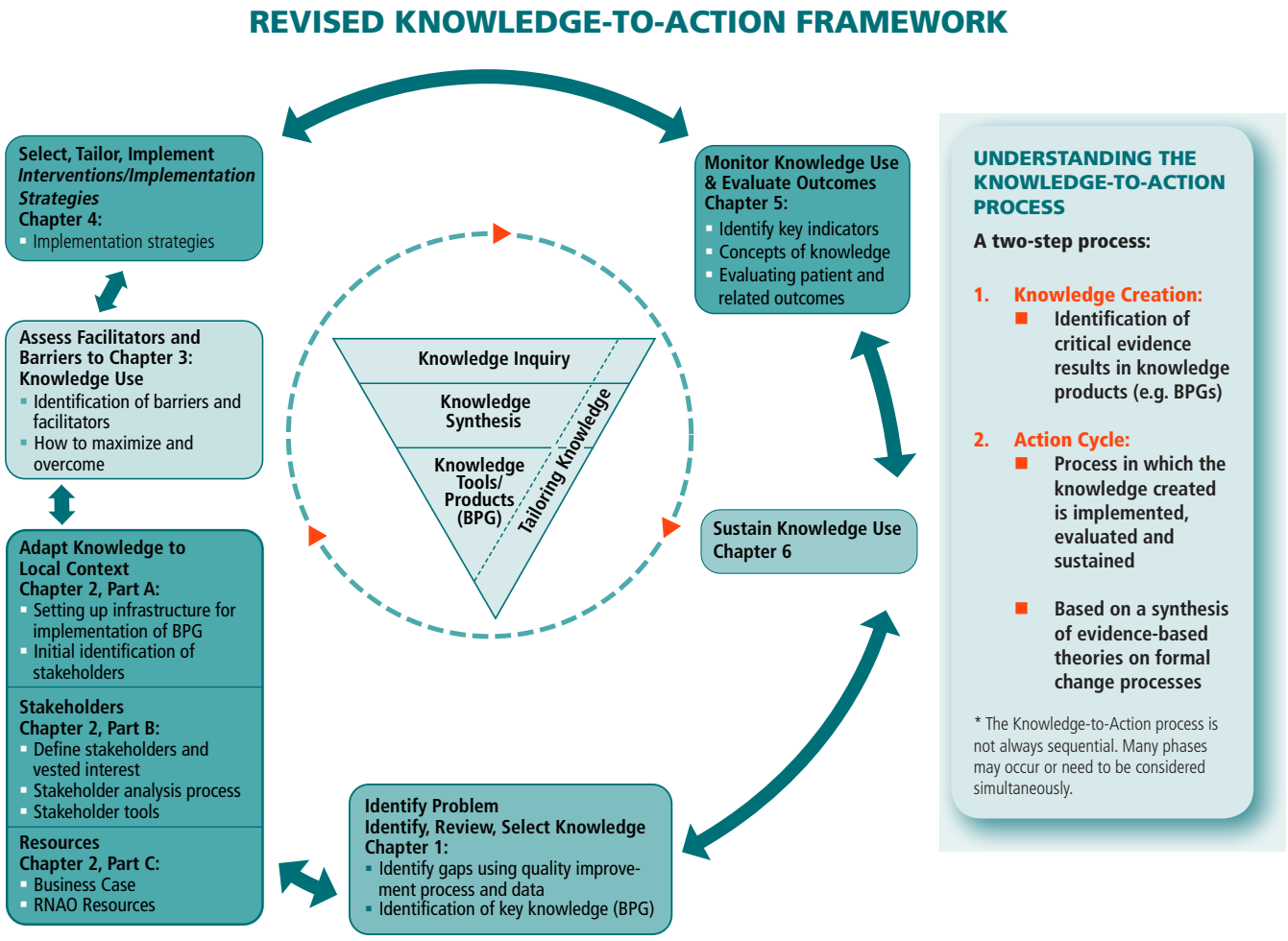
RNAO is committed to widespread deployment and implementation of our BPGs. We use a coordinated approach to dissemination, incorporating a variety of strategies, including:

1. The Nursing Best Practice Champion Network®, which develops the capacity of individual nurses to foster awareness, engagement, and adoption of BPGs;
2. Nursing order sets[G], which provide clear, concise, actionable intervention statements derived from the BPGs' practice recommendations that can be readily embedded within electronic medical records, but may also be used in paper-based or hybrid environments; and
3. The Best Practice Spotlight Organization® (BPSO®) designation, which supports implementation at the organization and system levels. BPSOs® focus on developing evidence-based cultures with the specific mandate to implement, evaluate, and sustain multiple RNAO BPGs.

In addition, we offer annual capacity-building learning institutes on specific BPGs and their implementation. Information about our implementation strategies can be found at:

- RNAO Best Practice Champions Network®: RNAO.ca/bpg/get-involved/champions
- RNAO Nursing Order Sets: RNAO.ca/bpg/initiatives/nursing-order-sets
- RNAO Best Practice Spotlight Organizations®: RNAO.ca/bpg/bpso
- RNAO capacity-building learning institutes and other professional development opportunities: RNAO.ca/events

Figure 3: Knowledge-to-Action Framework



Adapted from "Knowledge Translation in Health Care: Moving from Evidence to Practice". S. Straus, J. Tetroe, and I. Graham. Copyright 2009 by the Blackwell Publishing Ltd. Adapted with permission.

Guideline Evaluation

Table 7 provides potential evaluation measures to assess overall Guideline success. It is important to evaluate evidence-based practice changes when implementing a guideline. Select the measures most relevant to the practice setting. The listed data repositories are legislated mandatory reporting for Ontario and Canada. The instruments listed are used to collect the data for the listed measures.

Table 7: Evaluation Measures for Overall Guideline Success

EVALUATION MEASURES	MEASURES IN DATA REPOSITORIES/INSTRUMENTS
Incidence:	
Rate of falls per 1,000 patient days (hospital care)	NQuIRE®[1]
Rate of falls per 1,000 patient visits (home care, primary care)	NQuIRE
Falls in the past 30 days	NQuIRE, CIHI CCRS[2], RAI-MDS 2.0[3], interRAI-AC[4]
Falls in the last 90 days (long-stay home care clients)	CIHI HCRS[5], OACCAC HCD[6], RAI-HC[7], interRAI-CA[8]
Falls on admission/discharge (hospital care)	CIHI DAD[9] (C-HOBIC[10]), interRAI-AC
Percentage of falls-related hospitalizations	CIHI DAD, CIHI NACRS[11] & Statistics Canada, CIHI OTN[12]
Percentage of hip fracture hospitalizations related to falls	CIHI DAD, CIHI HMDB[13]
Percentage of fall injuries resulting in death	NQuIRE, CIHI OTN
Percentage of adults that received post-fall interventions	New
Number or percentage of rounds completed per day to prevent falls	New
Average length of stay in hospital related to falls and fall injuries	CIHI DAD, CIHI HMDB
Cost per adult per day/visit	New
Percentage of adults transferred to hospital from long-term care and/or home due to a fall	New
Percentage of adults transferred to long-term care due to fall in home and/or hospital	New

1 Nursing Quality Indicators for Reporting and Evaluation® (NQuIRE)
2 Canadian Institutes for Health Information Continuing Care Reporting System (CIHI CCRS)
3 The Resident Assessment Instrument Minimum Data Set Version 2.0 (RAI-MDS 2.0)

4 The interRAI–Acute Care (interRAI-AC)
5 Canadian Institute for Health Information Home Care Reporting System (CIHI HCRS)
6 Ontario Association of Community Care Access Centres Home Care Database (OACCAC HCD)
7 The Resident Assessment Instrument–Home Care (RAI-HC)
8 The interRAI–Contact Assessment (interRAI-CA)
9 Canadian Institute for Health Information Discharge Abstract Database (CIHI DAD)
10 Canadian-Health Outcomes for Better Information and Care (C-HOBIC)
11 Canadian Institute for Health Information National Ambulatory Care Reporting System (CIHI NACRS)
12 Canadian Institute for Health Information Ontario Trauma Registry (CIHI OTN)
13 Canadian Institute for Health Information Hospital Mortality Database (CIHI HMDB)

Table 8 supports evaluation of practice changes during implementation. The measures are directly associated with the recommendation statements and support process improvement.

Table 8: Implementation Measures for Overall Guideline Success

RECOMMENDATION	IMPLEMENTATION MEASURES	MEASURES IN DATA REPOSITORIES/INSTRUMENTS
1.1	Percentage of adults screened for falls risk: ■ On admission ■ Following a significant change in health status ■ Annually	New
1.2a	Percentage of adults at risk for falls assessed for individual falls risk factors through a comprehensive assessment	NQuIRE
1.2b	Percentage of adults referred for further assessment with recurrent falls, multiple risk factors, and/or complex needs	New
2.2	Number or percentage of adults at risk for falls or fall injury (including family/caregivers) who received education on falls prevention and interventions	New
2.3	Percentage of adults whose falls risk is communicated to the next responsible health-care provider and/or caregiver during care transitions	New
2.6	Percentage of adults at risk for falls who received a medication review and medication modifications to reduce their risk for falls	New

RECOMMENDATION	IMPLEMENTATION MEASURES	MEASURES IN DATA REPOSITORIES/INSTRUMENTS
2.9	Percentage of adults at high risk for falls and hip fracture who received hip protectors as an intervention	New
3.1	Percentage of adults that received a post-fall assessment following a fall	NQuIRE, CIHI CCRS, CIHI HCRS, RAI-MDS 2.0, RAI-HC & interRAI-CA
5.1	Percentage of organization-wide compliance with universal falls precautions	New
	■ Percentage of organization-wide compliance with bottom bed rails down (for split rail), if appropriate	New
	■ Percentage of organization-wide compliance with lowering bed height, if appropriate	New

Other RNAO resources for the evaluation and monitoring of BPGs:

- Nursing Quality Indicators for Reporting and Evaluation® (NQuIRE®), a unique nursing data system housed in the International Affairs and Best Practice Guideline Centre, allows Best Practice Spotlight Organizations® (BPSOs®) to measure the impact of BPG implementation by BPSOs worldwide. The NQuIRE data system collects, compares, and reports data on guideline-based nursing-sensitive process and outcome indicators. The international NQuIRE data system was launched in August 2012 to: (i) create and sustain evidence-based practice cultures, (ii) optimize patient safety, (iii) improve patient outcomes, and (iv) engage staff in identifying relationships between practice and outcomes to advance quality and advocate for resources and policy that support best practice changes (VanDeVelde-Coke et al., 2012). Please visit RNAO.ca/bpg/initiatives/nquire for more information.
- Nursing order sets embedded within electronic medical records provide a mechanism for electronic data capture of process indicators. The ability to link structure and process indicators with specific client outcome indicators aids in determining the impact of BPG implementation on specific client health outcomes. Please visit RNAO.ca/ehealth/nursingordersets for more information.

Process for Update and Review of Best Practice Guidelines

The Registered Nurses' Association of Ontario commits to updating its BPGs as follows:

1. Each BPG will be reviewed by a team of specialists in the topic area every five years following publication of the previous edition.
2. RNAO International Affairs and Best Practice Guideline (IABPG) Centre staff regularly monitor for new systematic reviews, randomized controlled trials, and other relevant literature in the field.
3. Based on that monitoring, staff may recommend an earlier revision period for a particular BPG. Appropriate consultation with members of the original expert panel and other specialists and experts in the field will help inform the decision to review and revise the BPG earlier than planned.
4. Three months prior to the review milestone, the staff commences planning of the review by:
   a) Inviting specialists in the field to participate on the expert panel. The panel will be comprised of members from the original panel as well as other recommended specialists and experts.
   b) Compiling feedback received and questions encountered during the implementation, including comments and experiences of Best Practice Spotlight Organizations® and other implementation sites regarding their experiences.
   c) Compiling a list of new clinical practice guidelines in the field and refining the purpose and scope.
   d) Developing a detailed work plan with target dates and deliverables for developing a new edition of the BPG.
5. New editions of BPGs will be disseminated based on established structures and processes.

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Appendix A: Glossary of Terms

Analytical study: Analytical studies test hypotheses about exposure–outcome relationships. The investigators do not assign an intervention, exposure, or treatment, but do measure the association between exposure and outcome over time using a comparison group (Centers for Disease Control and Prevention [CDC], 2013). Analytical study designs include case-control studies and cohort studies.

Case-control study: A study that compares people with a specific disease or outcome of interest (cases) to people from the same population without that disease or outcome (controls) (The Cochrane Collaboration, 2017).

Cohort study: An observational study in which a defined group of people (the cohort) is followed over time either prospectively or retrospectively (The Cochrane Collaboration, 2017).

Best practice guideline: Best practice guidelines are systematically developed, evidence-based documents that include recommendations for nurses and the interprofessional team, educators, leaders and policy makers, persons and their families on specific clinical and healthy work environment topics. BPGs promote consistency and excellence in clinical care, health policies, and health education, ultimately leading to optimal health outcomes for people and communities and the health-care system.

Bundling (care bundling/bundling care): A set of three to five evidence-based interventions selected from evidence-based guidelines with strong clinical consensus and implemented in a specific patient population in one location. Care bundles have a greater impact on outcomes than single interventions (Resar, Griffin, Haraden, & Nolan, 2012). A care bundle can be created from a single guideline or from different guidelines related to the outcome goals of the health organization.

Care transition: "A set of actions designed to ensure the safe and effective coordination and continuity of care as individuals experience a change in health status, care needs, health-care providers, or location (within, between, or across settings)" (Coleman & Boult, as cited in RNAO, 2014, p. 66).

Clinical judgment: "The application of information based on actual observation of a patient combined with subjective and objective data that lead to a conclusion" ("Clinical judgment," 2009).

Community setting: In this Guideline, a community setting refers to health care that is provided to a person who lives in their own place of residence (i.e., community dwelling). The person may be accessing a health-care provider at a health unit (e.g., primary care clinic, doctor's office) or through home care services.

Comprehensive assessment: In this Guideline, a comprehensive assessment refers to the identification of factors contributing to a person's risk for falls. It may uncover a range of risk factors, including biological, environmental, socio-economic, health conditions associated with an increased risk for falls, and factors associated with fall injury. A comprehensive assessment is used to help identify which factors can be modified or managed by interventions, and which interventions may be appropriate to prevent or reduce falls and fall injuries for that person.

Within the falls prevention literature, other terms are commonly used to describe assessments of falls risk, including but not limited to *multifactorial assessments* and *falls risk assessment*. However, within this Guideline, we highlight multifactorial assessment as one element within a comprehensive assessment. Furthermore, use of the term assessment is inconsistent within the literature, and is sometimes used interchangeably with the terms *screening* and *risk prediction*.

Consensus: A process used to reach agreement among a group or panel during a Delphi or modified Delphi technique (Avella, 2016). A consensus of 70% agreement from all panel members was required for the recommendations within this Guideline.

See *modified Delphi technique*

Controlled study: A clinical trial in which the investigator assigns an intervention, exposure, or treatment to participants who are not randomly allocated to the experimental and comparison or control group (The Cochrane Collaboration, 2017).

Cultural sensitivity: "Awareness, understanding, and attitudes toward culture and place the focus on self-awareness and insight" (RNAO, 2007, p. 71).

Descriptive study: A study that generates a hypothesis and describes characteristics of a sample of individuals at one point in time. The investigators do not assign an intervention, exposure, or treatment to test a hypothesis, but merely describe the who, where, or when in relation to an outcome (CDC, 2013; The Cochrane Collaboration, 2017). Descriptive study designs include cross-sectional studies.

Cross-sectional study: A study measuring the distribution of some characteristic(s) in a population at a particular point in time (also called a survey) (The Cochrane Collaboration, 2017).

Education recommendation: Statement of educational requirements and educational approaches/strategies for the introduction, implementation, and sustainability of the BPG.

Evidence-based nursing practice: The integration of the methodologically strongest research evidence with clinical expertise and patient values; unifies research evidence with clinical expertise and encourages the inclusion of patient preferences (Stevens, 2013).

Fall: An event that results in a person coming to rest inadvertently on the ground or floor or other lower level, with or without injury (WHO, 2016a).

Family: "A term used to refer to individuals who are related (biologically, emotionally, or legally) to and/or have close bonds (friendships, commitments, shared households and child rearing responsibilities, and romantic attachments) with the person receiving health care. A person's family may include all those whom the person identifies as significant in his or her life. … The person receiving care determines the importance and level of involvement of any of these individuals in their care based on his or her capacity" (Saskatchewan Ministry of Health, as cited in RNAO, 2015, p. 72).

Health-care provider: In this Guideline, the term health-care provider refers to regulated health-care providers or professionals and, in some cases, to unregulated health-care providers who provide care and services to persons and their families in any setting.

Health-care setting: In this Guideline, the term health-care setting is used broadly to refer to any location where health-care services are provided, including a person's home.

Hip protector (hip pad, hip protector pad): "Plastic shields (hard) or foam pads (soft) usually fitted in pockets in specially designed underwear. They are worn to cushion a sideways fall on the hip" (Santesso et al., 2014, p. 2).

Home care: "A health service provided in the patient's place of residence for the purpose of promoting, maintaining, or restoring health or minimizing the effects of illness and disability" ("Home care," 2009).

Implementation science: Methods to promote the systematic uptake of proven clinical treatments, practices, organizational, and management interventions into routine practice, and hence to improve health (BioMed Central, 2017).

Injury (fall injury): In this Guideline, a fall injury refers to any harm that may result from a fall, including a temporary or permanent physical injury, which may or may not require treatment (Safer Healthcare Now!, 2015), as well as any psychological harm such as fear of falling.

Interprofessional team: A team made up of different professions working together to reach a common goal and share decision-making to achieve the goal. The goal in health care is to work in a common effort with individuals and their families to enhance their goals and values (Ferris et al., 2002).

Intra-professional: "Multiple members of the same profession working collaboratively to deliver quality care within and across settings" (CNO, 2014, p. 3).

Long-term care (LTC): This Guideline uses the term long-term care (LTC) generically. The term is used to refer to "any congregate living residence, created for older adults and others with chronic illnesses, disabilities, and/or deficits in activities of daily living (ADL) or instrumental activities of daily living (IADL) that necessitate skilled nursing care on a daily basis. This would include, for example, facilities known as nursing homes and complex care facilities" (Canadian Coalition for Seniors' Mental Health, 2006, p. 8).

Medication review: A comprehensive review of medications by a physician, nurse practitioner, or pharmacist that includes a review of the person's medical conditions/diagnoses/health problems and medications prescribed (Safer Health Now!, 2015).

Meta-analysis: A systematic review of randomized controlled trials that uses statistical methods to analyze and summarize the results of the included studies (The Cochrane Collaboration, 2017).

See *systematic review*

Modified Delphi technique: The modified Delphi technique is a process whereby the initial recommendations, which were formulated to answer the research questions, are carefully created before being provided to the panel for a consensus-seeking process (Avella, 2016).

A modified Delphi technique was used during the Guideline development process. Although the identity of the panel members was not concealed, their individual responses to the survey questionnaires used to capture their opinion were concealed from the other members of the group.

Motivational interviewing: An evidence-based, client-centered, non-directive counselling method for enhancing a client's intrinsic motivation to change (Smedslund et al., 2011).

Multifactorial assessment: The use of the term multifactorial assessment varies within the falls prevention literature. In this Guideline, multifactorial assessments refer to an in-depth exploration of the multiple factors or conditions contributing to a risk for falls that involves members of an interprofessional team.

Nurse: "Refers to registered nurses, licensed practical nurses (referred to as registered practical nurses in Ontario), registered psychiatric nurses, and nurses in advanced practice roles such as nurse practitioners and clinical nurse specialists" (RNAO, 2013, p. 64).

Nursing order set: A group of evidence-based interventions specific to the domain of nursing. Nursing order sets are ordered independently by nurses (i.e., without a physician's signature) to standardize the care provided for a specific clinical condition or situation. Nursing order sets are derived from the practice recommendations within a guideline.

Organization and policy recommendation: Statement of conditions required for a practice setting that enable the successful implementation of the BPG. The conditions for success are largely the responsibility of the organization.

Person- and family-centred care; person-centred care: "A person- and family-centred approach to care demonstrates certain practices that put the person and their family members at the centre of health care and services. Person- and family-centred care respects and empowers individuals to be genuine partners with health-care providers for their health. The approach includes the following common themes and attributes:

- Fostering relationships and trust;
- Empowering the person to be actively involved in making decisions regarding their health care (independence and autonomy, right to self-determination);
- Sharing of evidence-based options for care, education, and information that is unbiased, clear, and comprehensive to support the person in making decisions;
- Respecting the person and personalizing care by promoting the person's strengths, self-knowledge, preferences, and goals for care based on their beliefs, values, culture, and their experience of health;
- Providing physical comfort within an environment that is conducive to healing;
- Offering emotional support and sympathetic presence;
- Ensuring continuity of care during transitions;
- Ensuring the person's ability to access care and services when needed;
- Partnering with the person and their family in health system reform to improve the quality, delivery, and design of health care and services at all levels (micro, meso, and macro);
- Communicating effectively within a therapeutic relationship to promote true health-care partnerships; and
- Caring for individuals, their families, and communities by addressing determinants of health (health promotion and disease prevention)" (RNAO, 2015, p. 75).

Physical training: In this Guideline, physical training refers to a range of interventions such as core strength training, perturbation based balance training, stepping training.

Polypharmacy: "The term polypharmacy refers to the group of medications one person may be taking ... It is generally used when that one person is taking too many medications, or when the drugs have been prescribed by many doctors, and may not have been coordinated well" (Rambhade, Chakarborty, Shrivastava, Patil, & Rambhade, 2012, p. 69).

Practice recommendation: Statement of best practice directed at health-care providers that enable the successful implementation of the BPG.

Psychotropic medication: Psychotropic medications fall into several categories, including as antidepressants, antianxiety drugs, antimanic agents (mood stabilizers), antipsychotics, and stimulants (Stanford School of Medicine, 2016).

Qualitative research: An approach to research that seeks to convey how human behaviour and experiences can be explained within the contexts of social structures and using an interactive and subjective approach to investigate and describe phenomena (Austin & Sutton, 2014).

Quasi-experimental study: A study that estimates causal effects by observing the exposure of interest, but in which the experiments are not directly controlled by the researcher and lack randomization (e.g., before-and-after designs) (Rockers, Rottingen, Shemilt, Tugwell, & Barnighausen, 2015).

Randomized controlled trial (RCT): An experiment in which the investigator assigns one or more interventions to participants who are randomly allocated to either the experimental group (receives intervention) and the comparison (conventional treatment) or control group (no intervention or placebo) (The Cochrane Collaboration, 2017).

Recurrent falls: The definition of recurrent falls is not explicit within most of the literature reviewed. Three reviews specify that recurrent falls include two or more falls (Beauchet, Dubost et al., 2011; Muir-Hunter & Wittwer, 2016; Vlaeyen et al., 2015) and one review outlines a timeframe of 12 months within which the two or more falls must occur (Beauchet, Dubost et al., 2011).

Reliability (reliable): The degree to which results from a measurement procedure can be reproduced with minimal measurement error (The Cochrane Collaboration, 2017).

Restraint: "Physical, chemical or environmental measures used to control the physical or behavioural activity of a person or a portion of his/her body" (CNO, 2017, p. 3).

Risk prediction tool: A tool that aims to calculate a person's risk of falling, either in terms of 'at risk/not at risk' or in terms of 'low/medium/high risk,' etc. (NICE, 2013).

Sarcopenia: "Sarcopenia is a progressive, insidious process characterized by 3–8% reduction in lean muscle mass per decade after the age of 30 years. It is thought to affect 30% of individuals over 60 years of age and more than 50% of those over 80 years" (Paddon-Jones & Rasmussen, 2009, p. 1).

Screening: Within the falls prevention literature, the use of the term *screening* is inconsistent and is sometimes used interchangeably with the terms *assessment* and *risk prediction*.

In this Guideline, screening refers to a brief process that is used to identify individuals who require further investigation into falls risk factors, and tailored interventions. Screening involves short questions, plus observations and clinical judgment. Whenever possible, this screening should be integrated into other care processes, such as admission assessments.

Severity of fall injury (degree of harm): The severity of injury from a fall or the degree of harm can be classified in several ways. Two examples follow:

Example #1: WHO (2009) International Classification for Patient Safety:

- **None:** Patient outcome is not symptomatic or no symptoms detected and no treatment is required.
- **Mild:** Patient outcome is symptomatic, symptoms are mild, loss of function or harm is minimal or intermediate but short-term, and no or minimal intervention (e.g., extra observation, investigation, review, or minor treatment) is required.
- **Moderate:** Patient outcome is symptomatic, requiring intervention (e.g., additional operative procedure, additional therapeutic treatment), an increased length of stay, or causing permanent or long-term harm or loss of function.
- **Severe:** Patient outcome is symptomatic, requiring life-saving intervention or major surgical/medical intervention, shortening life expectancy, or causing major permanent or long-term harm or loss of function
- **Death:** On balance of probabilities, death was caused or brought forward in the short-term by the incident.

Example #2 (National Database of Nursing Quality Indicators, as cited in definitions, CPSI, 2013):

- **No Harm:** Post-fall evaluation indicates no injuries (no signs or symptoms) resulting from the fall.
- **Minor Harm:** Injury results in application of a dressing, ice, cleaning of a wound, limb elevation, topical medication, bruise, or abrasion.
- **Moderate Harm:** Injury results in suturing, application of steri-strips/skin glue, splinting, or muscle/joint strain.
- **Major Harm:** Injury results in surgery, casting, and/or traction (typically fractures); required consultation for neurological (e.g., basilar skull fracture, subdural hematoma) or internal injury (e.g., rib fracture, liver laceration), or patients with coagulopathy who receive blood products as a result of the fall.
- **Death:** Patient died as a result of injuries sustained from the fall.

Social determinants of health: The social determinants of health are "the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries" (WHO, 2017).

Substitute decision-maker (SDM): A substitute decision-maker is a person who makes decisions for another who is not mentally capable. This may include making certain decisions about the person's property or personal care (Wahl, 2009).

Stakeholder: An individual, group, or organization that has a vested interest in the decisions and actions of organizations, and may attempt to influence decisions and actions (Baker et al., 1999). Stakeholders include all of the individuals and groups who will be directly or indirectly affected by the change or solution to the problem.

Systematic review: A comprehensive review of the literature that uses clearly formulated questions and systematic and explicit methods to identify, select, and critically appraise relevant research. A systematic review collects and analyzes data from the included studies and presents them, sometimes using statistical methods (The Cochrane Collaboration, 2017).

See *meta-analysis*

Universal falls precautions: In this Guideline, universal falls precautions are described as interventions applied in the health-care setting from which everyone benefits. Universal falls precautions are automatically applied for all people, regardless of whether or not they are deemed at risk for falls.

Validated (validity): The degree to which a measurement is likely to be true and free of bias (The Cochrane Collaboration, 2017).

Appendix B: Concepts That Align with This Guideline

Table 9: Concepts that Align with Preventing Falls and Fall Injuries & Suggested Resources

CONCEPT/TOPIC	RESOURCE(S)
Alternative approaches to restraints	Registered Nurses' Association of Ontario. (2012). *Promoting safety: Alternative approaches to the use of restraints*. Toronto, ON: Author. RNAO.ca/bpg/guidelines/promoting-safety-alternative-approaches-use-restraints
Care transitions	Registered Nurses' Association of Ontario. (2014). *Care transitions*. Toronto, ON: Registered Nurses' Association of Ontario. RNAO.ca/bpg/guidelines/care-transitions
Cultural sensitivity	College of Nurses of Ontario. (2009). *Culturally sensitive care*. Toronto, ON: Author. http://www.cno.org/globalassets/docs/prac/41040_culturallysens.pdf Registered Nurses' Association of Ontario. (2007). *Embracing cultural diversity in health care: Developing cultural competence*. Toronto, ON: Author. RNAO.ca/bpg/guidelines/embracing-cultural-diversity-health-care-developing-cultural-competence
Implementation science; implementation frameworks and resources	Registered Nurses' Association of Ontario. (2012). *Toolkit: Implementation of best practice guidelines* (2nd ed.). Toronto, ON: Author. RNAO.ca/bpg/resources/toolkit-implementation-best-practice-guidelines-second-edition Canadian Patient Safety Institute. (2015). *Improvement frameworks getting started kit* http://www.patientsafetyinstitute.ca/en/toolsResources/ImprovementFramework/Pages/default.aspx The Center for Research in Implementation Science and Prevention's online database: *Dissemination & implementation models in health research & practice* http://dissemination-implementation.org/content/resources.aspx The National Implementation Research Network's Active Implementation Hub (online learning materials, tools, and work spaces) http://implementation.fpg.unc.edu/

CONCEPT/TOPIC	RESOURCE(S)
Interprofessional and intra-professional collaboration	Registered Nurses' Association of Ontario. (2013). *Developing and sustaining interprofessional health care: Optimizing patients/clients, organizational, and system outcomes*. Toronto, ON: Author. RNAO.ca/bpg/guidelines/interprofessional-team-work-healthcare Registered Nurses' Association of Ontario. (2016). *Intra-professional collaborative practice among nurses*. Toronto, ON: Author. RNAO.ca/bpg/guidelines/intra-professional-collaborative-practice-among-nurses
Motivational interviewing (for behaviour change)	Motivational Interviewing Network of Trainers. (2016) *Excellence in motivational interviewing*. http://www.motivationalinterviewing.org Miller, W. R., & Rollnick, S. (2012). *Motivational interviewing: Helping people change*. New York, NY: Guilford Press. Registered Nurses' Association of Ontario. (2010). *Self-management in chronic conditions: Collaboration with clients*. Toronto, ON: Author. [See Appendix C: The Five A's.] RNAO.ca/bpg/guidelines/strategies-support-selfmanagement-chronic-conditions-collaboration-clients
Person- and family-centred care	Registered Nurses' Association of Ontario. (2015). *Person- and family-centred care*. Toronto, ON: Author. RNAO.ca/bpg/guidelines/person-and-family-centred-care
Self-management	Registered Nurses' Association of Ontario. (2010). *Strategies to support self-management in chronic conditions: Collaboration with clients*. Toronto, ON: Author. RNAO.ca/bpg/guidelines/strategies-support-selfmanagement-chronic-conditions-collaboration-clients
Social determinants of health	World Health Organization. (2017). *Social determinants of health*. http://www.who.int/social_determinants/en/ Nursing towards equity: Applying the social determinants of health in practice. [RNAO eLearning course. See Mental Health and Addictions and Tobacco Free Section.] http://elearning.RNAO.ca

Appendix C: Guideline Development Process

The Registered Nurses' Association of Ontario (RNAO) is committed to ensuring every BPG is based on the best available evidence. To meet international standards, a monitoring and revision process has been established for each Guideline every five years.

For this revised Guideline, RNAO assembled a panel of experts who represent a range of sectors and practice areas (see the **RNAO Expert Panel section**). A systematic review of the evidence was based on the purpose and scope, and was supported by the five research questions listed below. The systematic review was conducted to capture relevant peer-reviewed literature published between January 2011 and May–August 2016. The following research questions were established to guide the systematic review:

1. What are the most effective ways to identify adults at risk for falls or at risk for injury due to falls?
2. What interventions are effective in preventing falls and reducing the risk for falls or falls-related injury (among people at risk for falls)?
3. What interventions or processes should occur immediately following a fall?
4. What education should be included in training and ongoing educational programs for nurses and other health-care providers to effectively prevent falls and injury from falls?
5. What organizational policies and system-level supports are required to effectively prevent falls and injury from falls (among those at risk for falls/injury from falls)?

The RNAO Best Practice Guideline Program Team and expert panel's work to integrate the most current and best evidence, and ensure the validity[G], appropriateness, and safety of the Guideline recommendations with supporting evidence and/or expert panel consensus[G].

A modified Delphi technique[G] was employed to obtain panel consensus on the recommendations.

Appendix D: Systematic Review and Search Strategy

Guideline Review

The RNAO Best Practice Guideline Program Team's Project Coordinator searched an established list of websites for guidelines and other relevant content published between July 2010 and May 2016. The resulting list was compiled based on knowledge of evidence-based-practice websites and recommendations from the literature. Expert panel members were also asked to suggest additional guidelines. See the **Guidelines Review Process Flow Diagram** below. Detailed information about the search strategy for existing guidelines, including the list of websites searched and inclusion criteria, is available at www.RNAO.ca

The Guideline Development Lead and Nursing Research Associates appraised 12 international guidelines using the Appraisal of Guidelines for Research and Evaluation Instrument II (Brouwers et al., 2010). Guidelines with an overall score of four or below were considered weak and were excluded. Guidelines with a score of five were considered moderate, and guidelines with a score of six or seven were considered strong. The following five guidelines (rated moderate or strong) were selected to inform the recommendations and discussions of evidence:

- College of Occupational Therapists. (2015). *Occupational therapy in the prevention and management of falls in adults*. London, UK: Author.
- National Institute for Health and Care Excellence. (2013). *Assessment and prevention of falls in older people*. Manchester, UK: Author.
- Papaioannou A, Santesso, N., Morin, S. N., Feldman, S., Adachi, J. D., Crilly, R., ... Cheung, A. M. (2015). Recommendations for preventing fracture in long-term care. *Canadian Medical Association Journal, 187*(15), 1135–1144.
- U.S. Preventive Services Task Force. (2012). Prevention of falls in community-dwelling older adults: U.S. Preventive Services Task Force recommendation statement. *Annals of Internal Medicine, 153*(3), 197–204.
- Workgroup of the Consensus Conference on Vitamin D for the Prevention of Falls and their Consequences. (2014). *American Geriatrics Society Consensus Statement: Vitamin D for Prevention of Falls and their Consequences in Older Adults*. New York, NY: American Geriatrics Society.

Systematic Review

A comprehensive search strategy was developed by RNAO's research team and a health sciences librarian, based on inclusion and exclusion criteria created with the RNAO expert panel. A search for relevant reviews published in English only between January 2011 and May–August 2016 was applied to the following databases: Cumulative Index to Nursing and Allied Health (CINAHL), MEDLINE, MEDLINE In Process, Cochrane Library (Cochrane Database of Systematic Reviews), and EMBASE; Education Resources Information Center (ERIC) was used for question four only. Panel members were asked to review personal libraries for key reviews not found through the above search strategies.

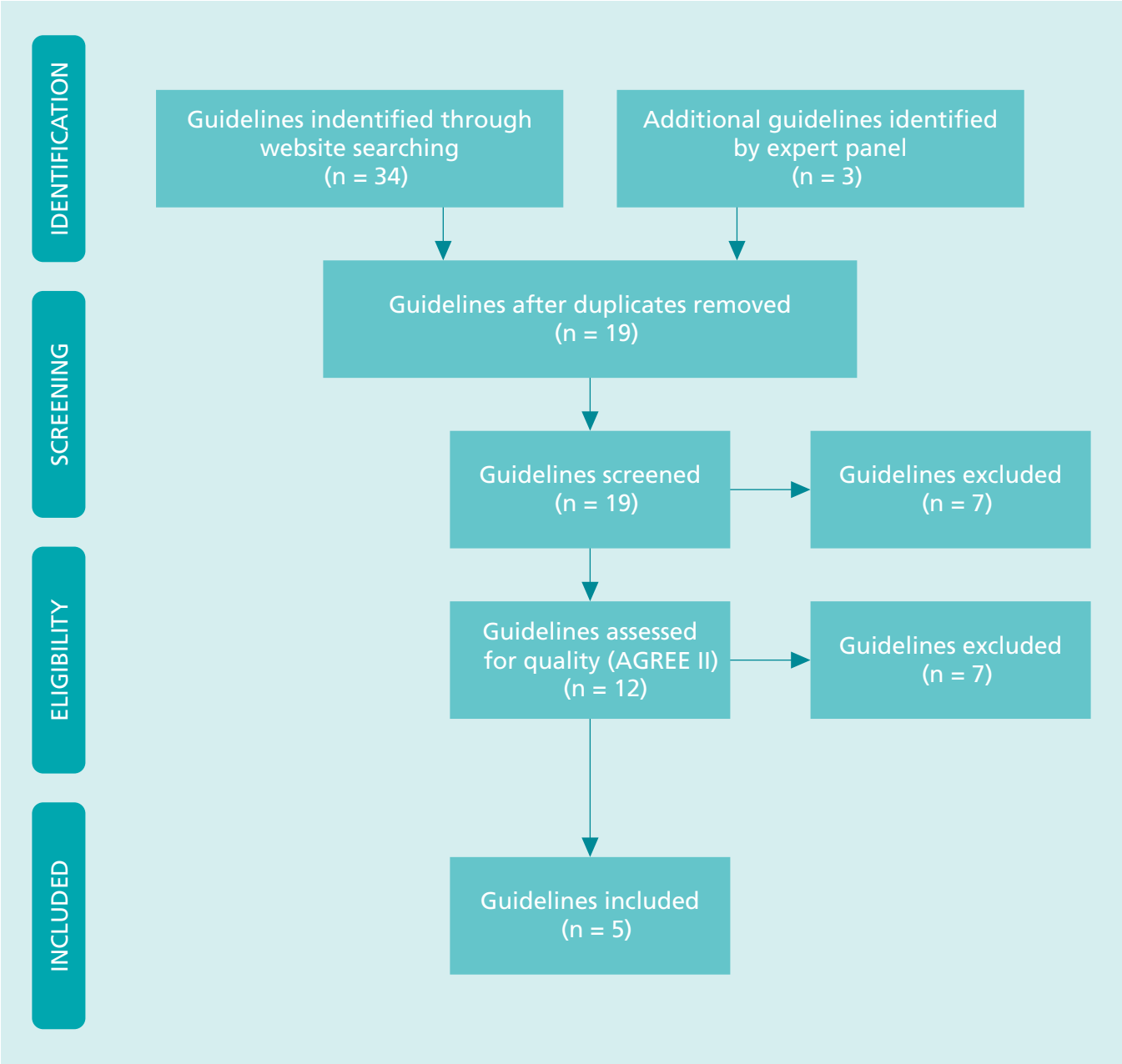
Detailed information on the search strategy for the systematic review, including the inclusion and exclusion criteria and search terms, is available at RNAO.ca/bpg/guidelines/prevention-falls-and-fall-injuries.

Reviews were independently assessed for relevance and eligibility based on the inclusion/exclusion criteria by two RNAO Nursing Research Associates. Any disagreements were resolved through tie-breaking by the Guideline Development Lead.

Quality appraisal scores for 40 reviews (a random sample of 20 percent of the total reviews eligible for data extraction and quality appraisal) were independently assessed by the RNAO Nursing Research Associates. Quality appraisal was assessed using AMSTAR (A Measurement Tool to Assess Systematic Reviews; see http://amstar.ca/index.php) and RNAO's scoring system that rates reviews as low, moderate, or strong (see **Table 2**). The Research Associates reached acceptable inter-rater agreement (kappa statistic, K=0.73), which justified proceeding with quality appraisal and data extraction for the remaining reviews. The remaining reviews were divided equally between the two Research Associates for quality appraisal and data extraction (Fleiss, Levin, & Paik, 2003). Research summaries of literature findings were completed and used to narratively describe the results. The comprehensive data tables and research summaries were provided to all expert panel members for review and discussion.

A complete bibliography of all full text reviews screened for inclusion is available at RNAO.ca/bpg/guidelines/prevention-falls-and-fall-injuries.

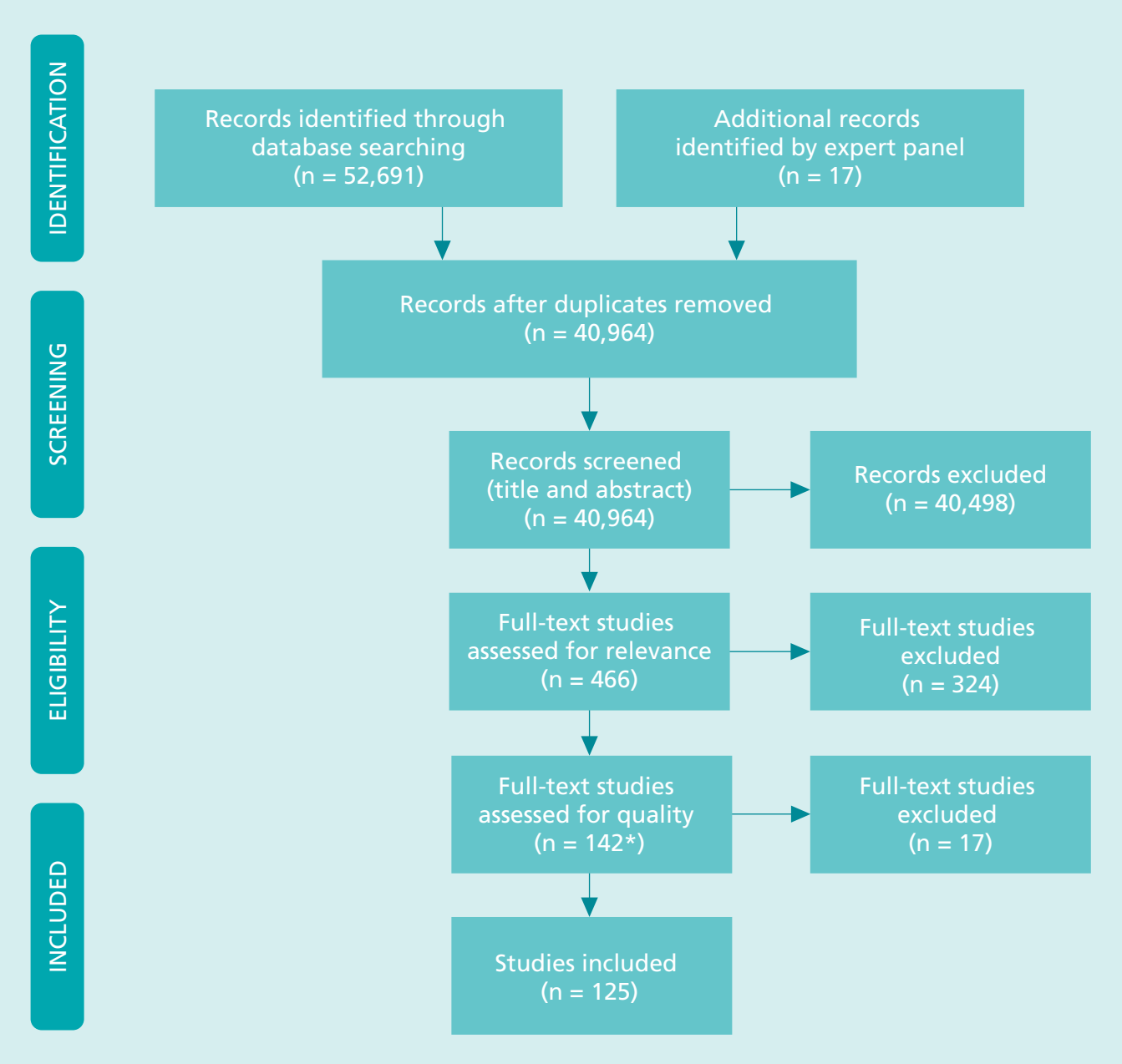
Guidelines Review Process Flow Diagram



Included guidelines had an overall AGREE II score of four or more (out of seven).

Flow diagram adapted from D. Moher, A. Liberati, J. Tetzlaff, D. G. Altman, and The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *BMJ 339*, b2535, doi: 10.1136/bmj.b2535

Prisma Flow Diagram



*154 total studies were included in all five research questions; however, 12 of these studies were duplicates, with findings relevant to more than one research question.

Flow diagram adapted from D. Moher, A. Liberati, J. Tetzlaff, D. G. Altman, and The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *BMJ 339*, b2535, doi: 10.1136/bmj.b2535

Appendix E: List of Risk Factors

Tables 10, **11** and **12** outline falls risk factors, health conditions associated with increased risk for falls, and factors associated with an increased risk for fall injuries. This is not an exhaustive list. The key findings from the evidence are included. Categories for risk factors vary in the literature and some risk factors may fall under more than one category. Additional risk factors and conditions were added based on the expert panel; these are indicated by an asterisk (*) symbol.

Table 10: Falls Risk Factors

FALLS RISK FACTOR GROUP	RISK FACTORS
Behavioural or psychological (activity-related)	■ Hurrying; not paying attention* ■ Taking risks (e.g., climbing on a chair) ■ Physical inactivity ■ Fear of falling ■ Dual tasking (performing two tasks simultaneously) ■ Incorrect use of assistive devices ■ Wearing unsupportive footwear ■ Substance use (i.e., drugs and alcohol)*
Biological (sometimes called intrinsic)	Non-modifiable: ■ Advanced age and/or associated frailty ■ Previous falls ■ Some diseases (e.g., macular degeneration, glaucoma, dementia)* Modifiable (or amenable to interventions to reduce risk): ■ Impaired balance, gait, or mobility, including disability, amputation, muscle weakness (especially in legs), slowed reflexes (reactive power) ■ Cognitive impairments: confusion or altered mental status, delirium ■ Impaired vision ■ Incontinence ■ Malnutrition and related sarcopenia (loss of muscle mass and strength) ■ Symptoms: □ Vertigo, dizziness □ Sleep disturbance □ Postural hypotension

FALLS RISK FACTOR GROUP	RISK FACTORS
Environmental or situational (sometimes called extrinsic)	■ Polypharmacy ■ Use of certain medications (e.g., anticonvulsants, tranquilizers, antihypertensives, opioids/narcotics, anti-depressants) ■ Home hazards (e.g., loose carpets, pets, stairs) ■ Prolonged hospital stay ■ Need for transfer assistance ■ Use of restraints* ■ Side rails*
Socio-economic*	■ Unable to afford supportive footwear* ■ Unable to afford certain medications, nutritious foods* ■ No social supports; isolated* ■ Unable to read (e.g., instructions on medicine bottles)*

Sources: Ambrose et al., 2015; Ambrose et al., 2013; Boelens et al., 2013; Callis, 2016; Deandrea et al., 2013; Flaherty & Josephson, 2013; Gleeson et al., 2014; NICE, 2013; Papaioannou et al., 2015; Rice et al., 2015; Vieira et al., 2011; Wallis & Campbell, 2011; Zhao & Kim, 2015.

* Provided by the expert panel.

Note: Findings regarding gender as a risk factor for falls (i.e., whether being male or female increased the risk for falls) was inconsistent in the literature (Ambrose et al., 2015; Ambrose et al., 2013; Callis, 2016; Deandrea et al., 2013).

Various diagnoses predispose a person to falls, including health conditions that affect strength, balance, mobility, judgment, and neurological function (e.g., sensation). **Table 11** provides a list of conditions and references with information on falls risk.

Table 11: Health Conditions Associated with Increased Risk for Falls

CONDITION	REFERENCES
Cancer	Callis, 2016
Dementia/cognitive impairment	Ambrose et al., 2015; Ambrose et al., 2013; Booth et al., 2015; Bunn et al., 2014; Burton et al., 2015; Chan et al., 2015; Guo et al., 2014; Hunter, Wagg, Kerridge, Chick, & Chambers, 2011; Jensen & Padilla, 2011; Meyer et al., 2015; Vieira et al., 2011; Winter, Watt, & Peel, 2013; Zhao & Kim, 2015
Haemophilia	Flaherty & Josephson, 2013
Multiple sclerosis	Gunn et al., 2015; Sosnoff & Sung, 2015
Osteoarthritis	Mat et al., 2015
Osteoporosis	Papaioannou et al., 2015
Overall frailty, older age	Ambrose et al., 2015; Ambrose et al., 2013; Bula, Monod, Hoskovec, & Rochat, 2011; Cadore et al., 2013; Guo et al., 2014; Vieira et al., 2011; Zhao & Kim, 2015; Zia et al., 2015
Parkinson's disease	Allen et al., 2011; Bloem et al., 2016; Mansfield et al., 2015; Monti, Bellini, Medri, & Pillastrini, 2011; Shen et al., 2016
Psychiatric illness (including depression)	Bunn et al., 2014; Callis, 2016; Changqing et al., 2015
Risks for non-ambulatory adults (those who utilize a wheelchair as their primary means of mobility) **Device-related characteristics (e.g., wheelchair design), transfer activities, impaired seated balance, other environmental factors (e.g., carpeted flooring)**	Rice et al., 2015
Stroke	Verheyden et al., 2013; Vieira et al., 2011; Walsh, Horgan, Walsh, & Galvin, 2016

Table 12 provides a list of specific factors associated with an increased risk of fall injury. References are provided as available.

Table 12: Factors Associated with Increased Risk of Fall Injury

RISK CATEGORY	SPECIFIC RISK FACTORS
Bleeding risk	■ Haemophilia (Flaherty & Josephson, 2013) ■ Thrombocytopenia* ■ Anticoagulation therapy* ■ Antiplatelet therapy* ■ Liver or kidney disease (hemodialysis)*
Fracture risk	■ Renal bone disease (dialysis)* ■ Residents in long-term care (may also apply to other settings*) with: □ prior hip or spine fracture; □ history of more than one fracture (other than hands, feet, or ankles); □ recent use of systemic glucocorticoids and history of fracture; and □ osteoporosis, osteopenia (Papaioannou et al., 2015).
Skin integrity risk*	Skin tears due to fragile skin and shearing forces*

* Provided by the expert panel.

Appendix F: Summary of Findings — Approaches and Tools for Assessing Falls Risk

Table 13 summarizes findings from the systematic review regarding approaches and tools used to assess risk for falls. It is important to note **that this is not a comprehensive list of all possible tools available**. Below the table is a list of websites that list additional tools.

Health-care organizations may review the findings below to support decision-making about the selection of approaches or tools for the setting and population(s) served.

Tools and approaches are ordered alphabetically in three categories: gait and/or balance, general falls risk, and fear of falling; there is no specific ranking of tools or approaches. Inclusion of a tool in this list does not constitute an endorsement by RNAO.

Table 13: Summary of Findings—Approaches and Tools for Assessing Falls Risk

NAME OF TOOL/ APPROACH	SETTING OR POPULATION	DESCRIPTION OF TOOL/ APPROACH	FINDINGS AND FUTURE CONSIDERATIONS
GAIT AND/OR BALANCE			
10-Meter Walk Test (10-MWT)	Setting: rehabilitation Population: patients in post-stroke rehabilitation	A clinical performance screening tool that measures the time it takes for a patient to walk 10 metres.	May be used in conjunction with clinical evaluation to assess falls risk (Lee, Geller, & Strasser, 2013).
Berg Balance Test	Setting: rehabilitation Population: patients in post-stroke rehabilitation	A clinical performance test of balance that rates the ability of an individual to maintain balance while performing ADL-related tasks. Components include balance, and lower and upper extremity strength.	May contribute to detailed assessment and diagnosis. Requires time, equipment, and clinical expertise. Appropriate for comprehensive assessment with interprofessional team (NICE, 2013). May be used in conjunction with clinical evaluation to assess falls risk (Lee et al., 2013).

NAME OF TOOL/ APPROACH	SETTING OR POPULATION	DESCRIPTION OF TOOL/ APPROACH	FINDINGS AND FUTURE CONSIDERATIONS
Dual- or single-task testing	Setting: community Population: older adults	Approaches used to assess the interaction between cognition and mobility. These include assessing a person's gait, either alone (single task) or while they perform a secondary motor or cognitive activity, such as walking and talking at the same time (dual task).	Single- and dual-task tests of gait speeds may help to identify people likely to fall (Menant, Schoene, Sarofim, & Lord, 2014). Deterioration in gait during dual-task testing is associated with an increased risk for falls, especially compared with single-tasks alone (Muir-Hunter & Wittwer, 2016). Mental tracking tests (e.g., that examine sustained attention, information processing and memory), together with the Timed Up and Go (TUG) Test, can help determine falls risk (Chu, Tang, Peng, & Chen, 2013).
Dynamic Gait Test	Setting: not provided Population: older adults	A test used to rate the ability of an individual to modify gait in response to changing task demands.	May contribute to detailed assessment and diagnosis. Requires time, equipment, and clinical expertise. Appropriate for comprehensive assessment with the interprofessional team (NICE, 2013).

NAME OF TOOL/ APPROACH	SETTING OR POPULATION	DESCRIPTION OF TOOL/ APPROACH	FINDINGS AND FUTURE CONSIDERATIONS
Functional Gait Assessment (FGA)	Setting: community outpatients Population: older adults	A falls screening tool that measures 10 items on a score of 0-3 (0 = most impaired; 3 = least impaired). The items are: Walking 1. at normal speeds, 2. fast, 3. at slow speeds, 4. with vertical head turns 5. with horizontal head turns, 6. with eyes closed, 7. over obstacles, 8. in tandem, 9. backward, 10. ascending and descending stairs.	May be used in conjunction with clinical evaluation to assess falls risk (Lee et al., 2013).
Functional reach	Setting: not specified Population: older adults	An assessment of balance challenges that may contribute to risk of falling. Measures, in inches/ centimetres, the distance between the arm's length and maximal forward reach using a fixed base of support.	May contribute to detailed assessment and diagnosis. Requires time, equipment, and clinical expertise. Appropriate for comprehensive assessment with interprofessional team (NICE, 2013). Feasible for primary care (U.S. Preventive Services Task Force, 2012).
Gait speed as a falls risk screening tool	Setting: community Population: older adults	Gait speed measurements taken as a screening tool for falls risk. In this review, the categories were: ■ <0.6 m/s as slow ■ 0.6–1.0 m/s as intermediate ■ 1.0–1.3 m/s as normal performance walker ■ >1.3 m/s as fast performance walker.	Although study results suggest that decreased gait speed may be associated with an increased risk of falls, it is unclear that gait speed can be used as a screening tool among community-dwelling older adults (Abu Samah, Mohd Nordin, Shahar, & Singh, 2016).

NAME OF TOOL/ APPROACH	SETTING OR POPULATION	DESCRIPTION OF TOOL/ APPROACH	FINDINGS AND FUTURE CONSIDERATIONS
Sensor-base falls technologies to predict falls risk	Setting: not specified, but included laboratory settings Population: older adults	Sensors attached to a person to monitor movement during daily activities (e.g., postural sway, functional mobility).	Sensors appear to detect differences between people who fall and those who do not fall (Ejupi, Lord, & Delbaere, 2014) and may help identify those most at risk (Howcroft, Kofman, & Lemaire, 2013). Further research is needed regarding the feasibility of these technologies in daily life settings (Ejupi et al., 2014; Howcroft et al., 2013).
Step Test	Setting: rehabilitation Population: patients in post-stroke rehabilitation	A clinical test of balance that requires stepping one foot on and off a 7.5-cm step as quickly as possible for 15 seconds and recording the number of completed steps (testing both legs and recording the lowest score).	May be used in conjunction with clinical evaluation to assess falls risk (Lee et al., 2013).
Timed Up and Go (TUG) Test	Setting: any setting, but most often in community Population: most often among older adults	A test that observes the time it takes a person to rise from an arm chair, walk three metres, turn, walk back, and sit down again.	One of the most frequently used tools to test balance and gait; appears to be useful in any setting (NICE, 2013). Clinical judgment is required to determine appropriate timed cut-off values (NICE, 2013). Should not be used in isolation to determine risk (Barry, Galvin, Keogh, Horgan, & Fahey, 2014). Predictive ability for future falls is limited (Beauchet, Fantino et al., 2011).

NAME OF TOOL/ APPROACH	SETTING OR POPULATION	DESCRIPTION OF TOOL/ APPROACH	FINDINGS AND FUTURE CONSIDERATIONS
Tinetti Scale	Setting: not specified Population: older adults	A scale that rates the ability of an individual to maintain balance while performing ADL-related tasks. Components include balance, and lower and upper extremity strength.	May contribute to detailed assessment and diagnosis. Requires time, equipment, and clinical expertise. Appropriate for comprehensive assessment with the interprofessional team (NICE, 2013).
Turn 180 Degrees	Setting: any setting Population: not specified	Observation and counting of steps taken to turn 180 degrees.	One of the most frequently used tools to test balance and gait. Appears to be useful in any setting, although predictive ability is unclear. Clinical judgment required to determine appropriate timed cut-off values (NICE, 2013).
GENERAL FALLS RISK			
Hendrich Fall Risk Model II	Setting: hospital Population: medical inpatients	A risk factor assessment and clinical performance screening tool that measures: confusion, disorientation, impulsivity, symptomatic depression, altered elimination, dizziness or vertigo, male gender, prescribed anti-epileptics, prescribed benzodiazepines, and *Get Up and Go Test*.	May be used in conjunction with clinical evaluation to assess falls risk (Lee et al., 2013).
St Thomas Risk Assessment Tool (STRATIFY)	Setting: hospital Population: medical inpatients < 65 years old and surgical inpatients	A falls screening tool questionnaire that includes history of falls, mental status, vision, toileting, transfers, and mobility.	May be used in conjunction with clinical evaluation to assess falls risk (Lee et al., 2013).

NAME OF TOOL/ APPROACH	SETTING OR POPULATION	DESCRIPTION OF TOOL/ APPROACH	FINDINGS AND FUTURE CONSIDERATIONS
FEAR OF FALLING			
Falls Efficacy Scale (FES-1)	Setting: mostly community Population: older adults with or without a history of falling	Measures level of concern carrying out both easy and more difficult physical activities and social activities without falling using a Likert-type scale.	The FES-1 long form is appropriate to assess fear of falling among high-risk older adults living in the community who are eligible for long-term care and functionally dependent (Greenberg, 2012).

Websites with additional tools

RNAO recognizes that many other tools are used in clinical settings to assess falls risk or to support comprehensive assessments (e.g., tools that assess incontinence, impaired vision, malnutrition, home environment, etc.).

The following websites are provided for information purposes of various tools and in some cases provide information about validity and/or reliability[G] of tools. RNAO is not responsible for the quality, accuracy, reliability, or currency of the information provided through these websites. Questions regarding tools should be directed to the source.

- The Regional Geriatric Program of Eastern Ontario: http://www.rgpeo.com/en/health-care-practitioners/falls-prevention-program/fall-risk-assessment-and-intervention.aspx
- The Senior Friendly Hospitals, clinical tools for falls: http://seniorfriendlyhospitals.ca/toolkit/processes-care/falls
- NICE, Appendix E: Evidence Table 9, Clinical practice guideline for the assessment and prevention of falls in older people: https://www.nice.org.uk/guidance/cg161/evidence/cg21-appendix-e-evidence-table-9-rehabilitation-other-key-documents-2004-pdf-190033746

Appendix G: Interventions for Falls Prevention and Injury Reduction

Tables 14, **15**, **16**, and **17** summarize evidence on specific falls prevention and injury reduction interventions. These tables include findings on a wide variety of interventions for falls prevention and/or injury reduction. The following interventions had larger bodies of evidence and have their own recommendations: environmental modifications (ensuring safe environment), exercise, medication management, rounding, vitamin D, education of the person at risk for falls, and hip protectors. For these interventions, references to the recommendation numbers are provided.

The tables are divided according to interventions with strong evidence (**Table 14**), potential benefit (**Table 15**), mixed findings (**Table 16**), and insufficient evidence (**Table 17**). Within each table, the interventions are organized in alphabetical order. When available, information is provided on the settings where research was conducted. Health-care providers must use their clinical judgment to determine whether particular interventions apply to their setting. The tables can be used to assist with deciding whether or not to initiate or continue to offer these interventions for falls prevention or injury reduction.

Table: 14: Interventions Supported by Strong Evidence

INTERVENTION	DESCRIPTION	RESEARCH FINDINGS
Environmental modifications	Providing universal falls precautions, modifying equipment and physical/ structural environment	See Discussion of Evidence for **Recommendation 5.1** on universal falls precautions, and modifying equipment and other factors in the physical/ structural environment
Exercise interventions and physical training	A range of interventions that address falls risk factors and help to prevent falls	See Discussion of Evidence for **Recommendation 2.5** and **Appendix H** on exercise interventions and physical training.
Footwear	Type of footwear worn and its association with falls	Findings within one strong review of community-based interventions found that anti-slip shoe devices reduce falls in icy conditions (Gillespie et al., 2012). Evidence from one moderately rated review on healthy older adults (unspecified setting) found: ■ thin, hard-soled footwear with high collars (surrounding the ankle region) may reduce risk of falling; ■ insoles with vibrating or magnetic features may improve balance; ■ high heels (> 2.5 cm) are associated with increased falls risk; and ■ shoes with thick, soft materials in midsole may cause instability (Aboutorabi et al., 2016).

INTERVENTION	DESCRIPTION	RESEARCH FINDINGS
Multi-faceted podiatry care	Podiatry care, including: footwear assessment, customised insoles, and foot and ankle exercises	One large trial of community-dwelling older adults within a strongly rated review found that multi-faceted podiatry care among people with disabling foot pain reduced falls (Gillespie et al., 2012).
Pacemakers	Device used to control heartbeat	Findings within one strong review of community-based interventions found that pacemakers reduced falls among those with sudden changes in heart rate and blood pressure (Gillespie et al., 2012). Pacemakers are also recommended in one strong guideline for people with cardio-inhibitory carotid sinus hypersensitivity (causing dizziness and fainting) and those who have unexplained falls (NICE, 2013).
Whole-body vibration for postmenopausal women	An anti-osteoporotic treatment for postmenopausal women that involves a vibration transmitted to the person through a vibrating platform on which she stands	One moderate review found that whole-body vibration appears to increase muscle strength and balance, and reduce falls and fractures among postmenopausal women (Ma, Liu, Sun, Zhu, & Wu, 2016).

Table 15: Interventions with Potential Benefit

INTERVENTION	DESCRIPTION	RESEARCH FINDINGS
Cognitive–motor interference	Training for the performance of two simultaneous tasks (a cognitive and a motor activity) to prevent falls	According to one moderate review, cognitive–motor interference was shown to be effective for preventing falls among older adults in the short term (Wang et al., 2015).
Continence management	Addressing incontinence as it relates to risk for falls	One study within a review rated low quality found that a prompted voiding schedule in long-term care, together with physical activity, appeared to reduce falls (Batchelor, Dow, & Low, 2013).
Medication management	Actions to reduce, gradually withdraw, or discontinue medications associated with falling	See Discussion of Evidence for **Recommendation 2.6**.

INTERVENTION	DESCRIPTION	RESEARCH FINDINGS
Medications for people at risk for fracture	Medications (e.g., bisphosphonates used to treat osteoporosis)	One strong guideline provides recommendations on specific medications for people in long-term care at risk of fracture that should and should not be taken. This includes a discussion of risks and benefits, and considerations such as fracture risk, renal function, and ability to swallow (Papaioannou et al., 2015).
Rounding	Checking in on a person to proactively meet their needs	See Discussion of Evidence for **Recommendation 5.3**.
Vitamin D	Vitamin supplementation	See Discussion of Evidence for **Recommendation 2.7**.

Table 16: Interventions with Mixed Findings

INTERVENTION	DESCRIPTION	RESEARCH FINDINGS
Education of the person at risk	Education of people at risk for falls/fall injury	See Discussion of Evidence for **Recommendation 2.2**.
Hip protectors	Shields or foam pads worn to cushion the hip during a fall	See Discussion of Evidence for **Recommendation 2.9**.
Home safety/ home assessment	Examples include assessment of home hazards, adaptation to home	One review rated low quality found that a pre-discharge home assessment visit (usually conducted by an occupational therapist) reduced the risk of falling, especially among people with a history of falls (Lockwood, Taylor, & Harding, 2015). According to one strong and moderate review and one strong guideline, there is lack of evidence demonstrating that home modifications/reducing home hazards reduces falls (Stubbs, Brefka, et al., 2015; Turner et al., 2011; U.S. Preventive Services Task Force, 2012). One strong review and one strong guideline suggest that home safety interventions are most appropriate for people at high risk for falls (e.g., those who have fallen) and when delivered by an occupational therapist (COT, 2015; Gillespie et al., 2012) or other trained professional (NICE, 2013). If home hazard assessment is conducted, it must be paired with interventions and follow-up to be effective (NICE, 2013).

INTERVENTION	DESCRIPTION	RESEARCH FINDINGS
Vision interventions	Including assessments, vision correction, cataract surgery	Vision assessment and referral for correction of visual impairment may help reduce falls if combined with other interventions, according to a strong guideline and a review rated low quality (NICE, 2013; Zhang, Shuai, & Li, 2015). However, two strong guidelines state that there is insufficient evidence demonstrating benefit of vision correction among community-dwelling older adults (NICE, 2013; U.S. Preventive Services Task Force, 2012). Single-lens glasses (versus multifocal lenses) may reduce falls for people who spend a great deal of time outdoors and are not frail, according to a strong review (Gillespie et al., 2012). One moderate review found limited evidence on the effectiveness of cataract surgery to reduce falls (Stubbs, Brefka, et al., 2015); however, a strong review reports a reduction in falls among women who had cataract surgery on the first affected eye (Gillespie et al., 2012).

Table 17: Interventions with Insufficient Evidence

INTERVENTION	DESCRIPTION	RESEARCH FINDINGS
Antimuscarinic medications	Medications used to treat overactive bladder and urinary urgency	The association between the use of antimuscarinic medications and falls risk is unclear, according to one low quality review (Hunter et al., 2011).
Falls detection technology (e.g., personal alarms around the neck or sensors that detect changes movement in the home)	Devices that distinguish falls from activities of daily living and then contact authorities who can quickly assist the individual if a fall has occurred	There is insufficient evidence to determine the effectiveness of falls detection technologies on falls prevention, early falls detection, or fear of falling, according to moderate review of people living in the community (Pietrzak, Cotea, & Pullman, 2014a). Some evidence has reported that these technologies may increase older adults' confidence, feelings of safety (Hawley-Hague, Boulton, Hall, Pfeiffer, & Todd, 2014; Pietrzak et al., 2014a; Stewart & McKinstry, 2012), and independence (Hawley-Hague et al., 2014). Considerations for acceptability include: reliability, ease of use, cost, control (e.g., ability to cancel false alarm), and privacy (Hawley-Hague et al., 2014; Pietrzak et al., 2014a). Technologies are generally acceptable among older adults if safety is a major concern (Hawley-Hague et al., 2014; Pietrzak et al., 2014a).

INTERVENTION	DESCRIPTION	RESEARCH FINDINGS
Low-height beds	A low-positioned bed intended to reduce kinetic energy of a fall and reduce injury	Common universal falls precautions include the use of low height beds (see **Appendix K**). There is little evidence for or against the use of low-height beds to prevent fall injury in hospital settings, according to one strong review (Anderson, Boshier, & Hanna, 2012).
Manual therapy	Hands-on techniques by therapists (e.g., chiropractor, physiotherapist) that address risk factors, such as postural stability and balance	There are limited and inconclusive research findings on the use of manual therapy to reduce falls, according to a moderate review (unspecified setting) (Holt, Haavik, & Elley, 2012).
Nutritional interventions or supplementation	Various interventions used to optimize nutrition	Findings cannot conclude that supplementation reduces the risk for falling, according to one strong review for community-dwelling older adults (Gillespie et al., 2012). There is insufficient evidence for or against the use of protein supplementation to prevent falls (U.S. Preventive Services Task Force, 2012). Multicomponent nutrition interventions (e.g., availability of snacks, food choice, extended meal times) may contribute to falls prevention efforts in long-term care, according to one low quality review (Wallis & Campbell, 2011).
Psychological interventions	Cognitive behavioural interventions, including feedback, counselling, and education discussions	Cognitive behavioural interventions have not been shown to reduce falls among community-dwelling older adults, according to one strong review (Gillespie et al., 2012). This is particularly true when falls risk status is unknown, according to a strong guideline (NICE, 2013). For community-dwelling older adults who are at risk for falls or are fearful of falling, one strong guideline recommends assessing fear of falling and falls risk and supporting activities that enable realistic risk-taking (COT, 2015).

INTERVENTION	DESCRIPTION	RESEARCH FINDINGS
Sensors (e.g., chair alarms, bed alarms, and wearable sensors)	Devices that detect and alert patients and staff about movements (e.g., getting out of bed or rising from a chair) so that staff can anticipate or prevent a fall	There is mixed or insufficient evidence regarding the benefits of bed exit alarms in hospital or long-term care, according to reviews rated strong and low quality. Challenges with the use of sensors include false alarms, staff desensitization to alarms, and staff relying too heavily on alarms (Anderson et al., 2012; Kosse, Brands, Bauer, Hortobagyi, & Lamoth, 2013). The use of alarms requires staff training and prompt reaction time (Kosse et al., 2013). Note: Health-care providers need to be aware of sector-specific legislation, regulations, or policies related to restraint use that may apply to the use of alarms.
"Sitter"/constant observation	Continuous observation for people at high risk for falls	There is mixed evidence demonstrating that sitters re-duce falls in acute-care settings, according to a low quality review (Lang, 2014).
Walking frames (walkers), assistive devices	Devices used to assist with mobility	A strong guideline suggests that assistive devices may be used together with other interventions to prevent falls (Papaioannou et al., 2015). Advice and instructions on the use of assistive devices are recommended in one guideline (COT, 2015). According to one low-quality review, evidence on walking frames neither proves nor disproves their effectiveness in the prevention of falls or their role in contributing to falls; the effect on posture and balance is unclear (O'Hare, Pryde, & Gracey, 2013).

Appendix H: Exercise and Physical Training Interventions

Different approaches to exercise and physical training interventions with varying degrees of effectiveness are described in the literature. The interventions are outlined in alphabetical order in **Table 18**.

Table 18: Exercise and Physical Training Interventions

TYPE OF TRAINING OR EXERCISE INTERVENTION	DEFINITION	POTENTIAL BENEFITS
Core strength training and Pilates exercise training	Core strength training includes exercises targeted at strengthening the core. "The core can be described as a muscular box with the abdominals in the front, paraspinals and glutes in the back, the diaphragm as the roof, and the pelvic floor and hip girdle musculature as the bottom" (Granacher, Gollhofer, Hortobagyi, Kressig, & Muehlbauer, 2013, p. 628). "Pilates-based exercises are designed to promote core stability/strength, flexibility, coordination, and balance. It is practiced on mats and/or with different types of Pilates apparatus (e.g., reformer, Pilates ring)" (Granacher et al., 2013, p. 628).	Mitigates deficits in measures of trunk muscle (core) strength, balance, functional performance, and falls (Barker, Bird, & Talevski, 2015; Bullo et al., 2015; Granacher et al., 2013). Increases muscle strength, walking and gait performance, dynamic balance, static balance, and flexibility in older adults (Bullo et al., 2015). Other potential benefits are improved functional capacity to perform activities of daily living and improved quality of life (Bullo et al., 2015).
Exergaming (interactive gaming)	The use of virtual reality-based games or computer programs (e.g., Nintendo Wii Fit) aimed at enhancing standing balance performance by providing immediate and interactive feedback (visual, auditory, or proprioceptive) to the user.	Enhances balance capabilities (Dennett & Taylor, 2015; Laufer, Dar, & Kodesh, 2014; Pietrzak, Cotea, & Pullman, 2014b). Requires supervision and careful selection of appropriate games (Laufer et al., 2014; Pietrzak et al., 2014b).

TYPE OF TRAINING OR EXERCISE INTERVENTION	DEFINITION	POTENTIAL BENEFITS
Falls prevention exercise programs	Multicomponent group or individual exercise programs that include gait and functional training, strengthening exercises, flexibility, and endurance or tai chi aimed at targeted falls risk factors (El-Khoury et al., 2013).	Reduced rate of falls, prevention of injury caused by falls (El-Khoury et al., 2013; U.S. Preventive Services Task Force, 2012). Effective for falls prevention, quality-of-life enhancement, and balance improvements in older adults (Martin et al., 2013). Group-based exercise promotes greater patient satisfaction and exercise adherence (Martin et al., 2013).
Foot and ankle exercises that strengthen and stretch the foot and ankle	Exercises that strengthen and stretch the foot and ankle.	Improves balance performance and ankle flexibility, and may help to reduce falls (Schwenk et al., 2013). Shown to be beneficial as part of multi-faceted podiatry care for people with disabling foot pain (Gillespie et al., 2012).
Individualized exercise or physiotherapy (home-based)	Exercise tailored to the person's needs and capabilities (different exercises selected based on assessment and modified based on individual progress); targets a reduction in falls (and/or) risk for falls.	Improves physical performance and function, including balance, leg strength, and physical activity (Hill, Hunter, Batchelor, Cavalheri, & Burton, 2015; U.S. Preventive Services Task Force, 2012).
Interactive cognitive–motor interventions (ICMI)	Examples of ICMI include step training, use of a balance board, and multicomponent and aerobic programs.	Improves physical and cognitive falls risk factors in older people, but it is unclear to what extent this reduces falls. These interventions particularly improve balance and strength, and have benefits equivalent to traditional training programs (Schoene, Valenzuela, Lord, & de Bruin, 2014). One potential risk involves possible feelings of increased sway after some training. Two studies reported an increase in sway after cognitive–motor training. Although this could potentially increase falls risk, it might also be associated with improved compensatory strategies (Schoene et al., 2014).

TYPE OF TRAINING OR EXERCISE INTERVENTION	DEFINITION	POTENTIAL BENEFITS
Muscle strengthening	Exercises that strengthen lower-limb muscles.	Lower-limb strengthening exercises reduce falls (Ishigaki, Ramos, Carvalho, & Lunardi, 2014).
Perturbation-based balance training	"A novel balance training intervention that incorporates exposure to repeated postural perturbations (something that causes disequilibrium in posture) to evoke rapid balance reactions, enabling the individual to improve control of these reactions with practice" (Mansfield et al., 2015, p. 701).	Reduces the likelihood and frequency of falling (Mansfield et al., 2015).
Stepping training	Stepping training aims to mimic a falls situation. Stepping interventions include reactive step training (using a body harness and supervision, and large expensive equipment) and volitional step training, which can be used in exercise classes or by individuals at home (Okubo, Schoene, & Lord, 2016).	Improves reaction time, gait, balance, and balance recovery, and was found to reduce falls in older adults by approximately 50 percent (Okubo et al., 2016). Context is important, as reactive step training would not be feasible in most settings. Also, findings are applicable mostly to healthy and high-risk older adults with balance and gait impairments or frailty, living in the community and in institutional settings, but not necessarily to people with certain conditions such as Parkinson's disease, stroke, dementia, and other cognitive impairments (Okubo et al., 2016).

TYPE OF TRAINING OR EXERCISE INTERVENTION	DEFINITION	POTENTIAL BENEFITS
Tai chi (alternate names: taiji, tai chi chuan)	"A traditional Chinese martial art involving slow and continuous but highly choreographed movements that incorporate unilateral and bilateral weight shift as well as trunk and extremity rotation" (Leung, Chan, Tsang, Tsang, & Jones, 2011, p. 40).	Increases balance confidence (i.e., "the perceived ability to perform activities without losing balance") (Rand, Miller, Yiu, & Eng, 2011, p. 297). Improves balance control (Huang & Liu, 2015; Leung et al., 2011; Song et al., 2015). Improves flexibility (Huang & Liu, 2015; Leung et al., 2011). Reduces falls and fear of falling; best suited if a person is not frail (Leung et al., 2011; Schleicher, Wedam, & Wu, 2012). Effective for people at lower risk for falls (Gillespie et al., 2012).
Yoga	"Yoga-based activity takes many forms, ranging from the practice of standing postures that aim to improve strength, flexibility and balance through to relaxation and meditation-based form" (Youkhana, Dean, Wolff, Sherrington, & Tiedemann, 2016, p. 22).	Results in small improvements in balance and medium improvements in physical mobility (Youkhana et al., 2016).

Appendix I: Medication Resources

A selection of medication resources identified within the systematic review, AGREE II-appraised guidelines, and by the expert panel are outlined in alphabetical order in Table 19. Inclusion in this list does not constitute an endorsement by RNAO.

Table 19: List of Medication Resources

RESOURCE	DESCRIPTION	ACCESS
Beers Criteria	Outlines medication classes that should be avoided or used with caution in older adults. Pocket cards may be purchased through the American Geriatrics Society website.	*American Geriatrics Society Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults (2015):* https://www.guideline.gov/content.aspx?id=49933
Canadian Patient Safety Institute	Provides a Medication Reconciliation (Med Rec): Getting Started Kit for home care, acute care, and long-term care, with the goal of preventing adverse drug events by implementing a medication reconciliation process upon admission, transfer, and discharge. Provides a Getting Started Kit, Reducing Falls and Injuries from Falls with information on medications associated with falls.	http://www.patientsafetyinstitute.ca/en/Pages/default.aspx
Centre for Effective Practice (CEC)	Provides a tool designed to help health-care providers understand, assess, and manage residents in long-term-care homes with behavioural and psychological symptoms of dementia, with a focus on appropriate use of antipsychotic medications. See "Antipsychotics and Dementia" under Tools.	http://effectivepractice.org/
STOPP & START Criteria	Addresses potentially inappropriate prescribing in older adults, including a screening tool of older persons' prescriptions (STOPP) and a screening tool to alert to right treatment (START).	See O'Mahony, D., Gallagher, P., Ryan, C., Byrne, S., Hamilton, H., Barry, P., ... Kennedy, J. (2010). STOPP & START criteria: A new approach to detecting potentially inappropriate prescribing in old age. *European Geriatric Medicine*, 1(1), 45–51.

Appendix J: Post-Fall Assessment Resources and Example

A range of post-fall assessments have been developed. Various resources are available to support such assessments that can be used to identify factors that contribute to falls at the individual, organizational, or systems level. Three of these resources are described in **Table 20** below, followed by an example of post-fall assessment documentation from St. Joseph's Healthcare Hamilton (Ontario, Canada).

Table 20: Resources to Support Post-Fall Assessments

RESOURCE	DESCRIPTION	ACCESS	ACCESS
Alberta Health Services (AHS)	*AHS Falls Risk Management Post-Falls Review*	Alberta Health Services has developed a falls risk management tool, called *AHS Falls Risk Management Post-Falls Review*. This resource outlines four key steps in a post-falls review: 1. Assess for injury and provide immediate care, 2. Monitor for 24–48 hours, 3. Conduct a post-fall huddle and reassess falls risk factors, and 4. Modify the care plan/ interventions.	Accessible on the Fall Prevention Month Toolkit, Practitioner Resources: http://fallpreventionmonth.ca/toolkit/practitioner-resources
Canadian Patient Safety Institute (CPSI)	*Canadian Incident Analysis Framework*	CPSI developed the *Canadian Incident Analysis Framework* to support those responsible for, or involved in, managing, analyzing, and/or learning from patient safety incidents in any health-care setting, with the goal of increasing the effectiveness of analysis in enhancing the safety and quality of patient care.	http://www.patientsafetyinstitute.ca/en/toolsResources/IncidentAnalysis/Documents/Canadian%20Incident%20Analysis%20Framework.PDF

ORGANIZATION	RESOURCE	DESCRIPTION	ACCESS
		The framework provides methods and tools to assist in answering the following questions: ■ What happened? ■ How and why did it happen? ■ What can be done to reduce the likelihood of recurrence and make care safer? ■ What was learned?	
Public Health Agency of Canada (PHAC)	*What to Do After a Fall*	PHAC has developed an illustrated poster that provides information about what to do if you have fallen (if you can or cannot get up) and what to do if you witness someone fall. The target audience for this resource is all adults (it is not directed specifically to health-care providers).	http://www.phac-aspc.gc.ca/seniors-aines/publications/public/injury-blessure/falls_poster-chutes_affiche/poster-affiche-eng.php

Example: Falls Debriefing and Action Plan from St. Joseph's Healthcare Hamilton (Ontario, Canada)

St. Joseph's Healthcare Hamilton

❑ Charlton Campus
❑ King Campus
❑ West 5th Campus

FALLS DEBRIEFING AND ACTION PLAN

Initial all boxes and entries

Date: _____ (yyyy/mm/dd) Time: _____ (hh:mm) Patient Identifier: _____ Team: _____

Environmental Contributors (eg. Lighting, footwear, slippery surfaces, furniture, patient action, etc.)

Contributors	Action Plan	Comments	Initials

Contributing age related changes (eg. Gait, balance, vision, postural sway, muscle strength, reaction time, cognitive impairment, poor judgement)

Contributors	Action Plan	Comments	Initials

Medical Contributors (eg. Seizure activity, Parkinson's, stroke, dementia, recent surgery, postural hypotension)

Contributors	Action Plan	Comments	Initials

Medication Contributors (eg. Sedatives, hypnotics, benzodiazepines, neuroleptics, antidepressants, diuretics, antihypertensives)

Contributors	Action Plan	Comments	Initials

Does the patient have a history of unsteady gait? ☐ Yes ☐ No
Was the level of supervision required marked clearly on the gait aid? ☐ Yes ☐ No
If No, indicate future action:

Printed Name:_____ Signature:_____ Initials:_____ Discipline:_____

Printed Name:_____ Signature:_____ Initials:_____ Discipline:_____

Printed Name:_____ Signature:_____ Initials:_____ Discipline:_____

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APPENDICES

St. Joseph's Healthcare Hamilton

❑ Charlton Campus
❑ King Campus
❑ West 5th Campus

FALLS DEBRIEFING AND ACTION PLAN

Initial all boxes and entries

Is the appropriate transfer technique identified on the patient's whiteboard? ☐ Yes ☐ No
If No, indicate future action: _____

_____

_____

Does the patient experience urinary urgency or incontinence? ☐ Yes ☐ No
If this is a contributor, how will it be addressed/monitored?

What has Pharmacy done?

What has PT done?

What has MD done?

What has Nursing done?

What has OT done?

Changes to plan of care?

Completed By: _____

Staff Present for debrief: _____

_____

Printed Name:_____ Signature:_____ Initials:_____ Discipline:_____

Printed Name:_____ Signature:_____ Initials:_____ Discipline:_____

Printed Name:_____ Signature:_____ Initials:_____ Discipline:_____

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Source: Created by St. Joseph's Healthcare Hamilton. Reprinted with permission.

Appendix K: Components and Example of Universal Falls Precautions

Table 21 lists common components included in universal falls precautions. Health-care organizations can determine which precautions are applicable to their setting. The list in **Table 21** and the poster that follows are examples only.

Table 21: Common Components of Universal Falls Precautions

General	■ Familiarize the person with the environment ■ Provide instruction on using the call bell ■ Mobilize when possible ■ Provide the following: □ Sturdy handrails in patient bathrooms, rooms, and hallways □ Adequate lighting (night light, supplemental lighting as needed) □ Uncluttered care areas □ All areas cleared of tripping hazards □ Incontinence precautions (safe and regular toileting)
Bed/chair	■ Low position (at the height of the knee or appropriate height when following hip precautions*) ■ Brakes locked (bed or chair) ■ Bottom bed rails down (for split rail*) unless assessed otherwise ■ Items within reach (personal items and call bell/light) ■ Document transfers/mobility assistance
Slipping	■ Non-slip, supportive footwear with a low heel ■ Clean, dry floor surfaces ■ Prompt clean-up of spills

Sources: Degelau et al., 2012; Scott, 2013; Wallis & Campbell, 2011.
* Provided by the expert panel.

Example: Universal Falls Precautions Poster from Fraser Health (British Columbia, Canada)

Source: Created by Fraser Health. Reprinted with permission.

Appendix L: Resources

The RNAO Best Practice Guideline Program Team, expert panel, and external stakeholder reviewers made recommendations for **Table 22**. The table lists, in alphabetical order, some of the main organizations that provide information or resources on the topics of falls prevention and/or injury reduction; additional resources may be available at the local level. Clinicians are also encouraged to research local supports (e.g., falls clinics, exercise programs, local falls prevention initiatives) for purposes of referrals and interprofessional care.

Links to websites are provided for information purposes only. RNAO is not responsible for the quality, accuracy, reliability, or currency of the information provided through these sources. Further, RNAO has not determined the extent to which these resources have been evaluated. Questions regarding these resources should be directed to the source.

Table 22: Organizations, Programs, and Resources That Provide Information Related to Falls Prevention and/or Injury Reduction

ORGANIZATION, PROGRAM, OR RESOURCE	DESCRIPTION	LINK
GENERAL FALLS PREVENTION/INJURY REDUCTION		
Accreditation Canada	Accreditation Canada is an independent, not-for-profit organization that accredits health-care and social services organizations. Accreditation Canada has a Required Organizational Practice (ROP) for falls prevention. It defines an ROP as an essential practice that organizations must have in place to enhance patient/client safety and minimize risk.	https://www.accreditation.ca/
Alberta Health Services (AHS)	AHS delivers health services to people living in Alberta, as well as to some residents of Saskatchewan, B.C., and the Northwest Territories. AHS has many resources for injury prevention and safety, including information about falls prevention. Resources include information sheets and information to share with clients.	http://www.albertahealthservices.ca/ http://www.albertahealthservices.ca/injprev/Page11930.aspx
BC Injury Research and Prevention Unit	The BC Injury Research and Prevention Unit is a leader in the production and transfer of injury prevention knowledge, supporting the integration of prevention practice into the daily lives of British Columbians. The BC Injury Research and Prevention Unit website includes fact and statistics about falls, information about falls prevention, links to other resources, and more.	http://www.injuryresearch.bc.ca/ http://www.injuryresearch.bc.ca/quick-facts/seniors-falls-prevention/

ORGANIZATION, PROGRAM, OR RESOURCE	DESCRIPTION	LINK
Canadian Patient Safety Institute (CPSI)	CPSI works with governments, health organizations, leaders, and health-care providers to inspire extraordinary improvement in patient safety and quality. CPSI has developed implementation resources, including: ■ Improvement Frameworks Getting Started Kit ■ Medication Reconciliation Getting Started Kit ■ Reducing Falls and Injuries from Falls Getting Started Kit	http://www.patientsafetyinstitute.ca
Ontario Neurotrauma Foundation (ONF)	ONF is the non-profit organization funded by the Ontario government that works to prevent neurotrauma, and to ensure Ontarians with neurotrauma lead full, productive lives. ONF supports falls prevention through knowledge exchange and by supporting the implementation of evidence-informed practices.	http://onf.org/
Osteoporosis Canada	Osteoporosis Canada is a national organization serving people who have, or are at risk for, osteoporosis. The organization works to educate, empower, and support individuals and communities in the risk-reduction and treatment of osteoporosis. Osteoporosis Canada provides information, recommendations, and resources to promote exercise, nutrition, and overall bone health, including particular recommendations for people with osteoporosis.	http://www.osteoporosis.ca/
Parachute	Parachute is a charity focused on injury prevention solutions, knowledge mobilization, public policy, and social awareness efforts that are designed to help keep Canadians safe. Parachute's vision is an injury-free Canada with Canadians living long lives to the fullest. The Parachute website includes a section on falls prevention.	http://www.parachutecanada.org/ http://www.parachutecanada.org/injury-topics/item/fall-prevention1

ORGANIZATION, PROGRAM, OR RESOURCE	DESCRIPTION	LINK
Public Health Agency of Canada (PHAC)	PHAC's mission is to promote and protect the health of Canadians through leadership, partnership, innovation, and action in public health. The PHAC website includes a variety of resources for falls prevention and injury reduction, and provides information that can be shared with clients.	http://www.phac-aspc.gc.ca http://www.phac-aspc.gc.ca/inj-bles/index-eng.php
TOOLKIT RESOURCES		
Fall Prevention Month	Fall Prevention Month encourages organizations to coordinate their efforts for a larger impact. Organizations in Ontario and beyond participate by planning activities and sharing evidence-based information on fall prevention. The Fall Prevention Month website includes a toolkit with resources chosen from local, provincial, and national sources.	http://fallpreventionmonth.ca/
RNAO Long-Term Care Best Practices *Toolkit*, 2nd Edition	The LTC Toolkit is designed to offer point-of-care staff, nurses, educators, and leaders access to the best available evidence-based resources and tools. It supports the use of best practice guidelines (BPGs), program development, implementation, and evaluation to enhance the quality of resident care and create a healthy work environment. It is intended to promote the integration of BPGs with relevant provincial legislation, performance improvement, and other health-care initiatives. The LTC Toolkit includes a section on falls prevention and management.	http://ltctoolkit.rnao.ca/ http://ltctoolkit.rnao.ca/clinical-topics/falls-prevention
PROFESSIONAL EDUCATION AND NETWORKING		
Canadian Falls Prevention Curriculum (University of Victoria, British Columbia, Canada)	An interactive facilitated five-week session offered in English through the University of Victoria, British Columbia, Canada. *Note:* Costs are associated with this course.	https://continuingstudies.uvic.ca/health-wellness-and-safety/courses/canadian-fall-prevention-curriculum

ORGANIZATION, PROGRAM, OR RESOURCE	DESCRIPTION	LINK
Loop: Fall Prevention Community of Practice (CoP)	A Community of Practice (CoP) that strives to create supportive communities in Ontario (and beyond) where adults enjoy quality of life and maintain their independence through the prevention of falls. LOOP supports members to build capacity in the prevention of falls and fall-related injuries.	http://www.fallsloop.com/
NUTRITION AND BONE HEALTH		
Agri-Food for Healthy Aging (A-HA)	A-HA is a collaborative research and knowledge translation group that aims to realize opportunities for Ontario's agri-food and health sectors to improve the health and well-being of older adults through the innovative use of food.	http://aha.the-ria.ca/
EatRight Ontario (ERO)	ERO is a free service that connects residents of Ontario to advice from Registered Dietitians (RDs). The website provides information, videos, recipes and interactive tools to support healthy food choices. RDs are available to answer nutrition questions via telephone and email.	https://www.eatrightontario.ca/en/
Health Canada	Health Canada provides Dietary Reference Intakes (recommendations for nutrient intakes) for healthy populations. These are established by Canadian and American scientists through a review process overseen by a non-governmental body in the United States. Information and recommendations for vitamin D, calcium, and other nutrients are available on the website.	https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/vitamins-minerals/vitamin-calcium-updated-dietary-reference-intakes-nutrition.html

ORGANIZATION, PROGRAM, OR RESOURCE	DESCRIPTION	LINK
EXERCISE		
Canadian Society for Exercise Physiology	Canadian Society for Exercise Physiology provides physical activity guidelines for adults and those with multiple sclerosis, spinal cord injury, and Parkinson's disease.	http://www.csep.ca/home
Canadian Centre of Activity and Aging (CCAA), University of Western Ontario	The CCAA promotes physical activity and the well-being of older adults through a combination of educational resources and community-based programs.	http://www.uwo.ca/ccaa/
PHYSICAL/STRUCTURAL ENVIRONMENT		
Alzheimer Society of Canada—Safe Environments	Alzheimer's Society of Canada's website includes specific information about maintaining a safe, dementia-friendly environment, including a home safety checklist and safety tips.	http://www.alzheimer.ca/en/Living-with-dementia/Day-to-day-living/Safety/Safety-in-the-home
Canadian Mortgage and Housing Corporation: Preventing Falls on Stairs	A safety resource created by the Canadian Mortgage and Housing Corporation about preventing falls on stairs and other safety tips.	https://www.cmhc-schl.gc.ca/odpub/pdf/63637.pdf
Code Plus: Physical Design Components for an Elder Friendly Hospital, 2nd Edition (2015, Fraser Health)	A guide focusing on generic components of physical design that pertain to preserving the functional ability and safety of older adults admitted to hospital.	http://www.seniorvriendelijkziekenhuis.nl/wp-content/uploads/2015/06/CodePlus-Final2-April-2015.pdf
Ontario Long-Term Care Home Design Manual	The Long-Term Care (LTC) Home Design Manual (2015) contains the Ministry of Health and Long-Term Care's design standards for LTC homes being developed or redeveloped in Ontario.	http://www.health.gov.on.ca/en/public/programs/ltc/docs/home_design_manual.pdf

Endorsements

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CANADA
Better Quality. Better Health.
Meilleure qualité. Meilleure santé.

August 29, 2017

Doris Grinspun, RN, MSN, PhD, LLD(hon), O.ONT
Chief Executive Officer
Registered Nurses' Association of Ontario (RNAO)
158 Pearl Street
Toronto, ON M5H 1L3

Dear Dr. Grinspun,

On behalf of Accreditation Canada, I am pleased to congratulate the Registered Nurses' Association of Ontario on the publication of the new edition guideline titled, *Preventing Falls and Reducing Injury from Falls, Third Edition*. Under your leadership, RNAO continues to make remarkable progress in the area of evidence-based resources and we congratulate you on your success.

At Accreditation Canada, we work with health-care organizations to help them improve quality, safety, and efficiency so that they can offer the best possible care and service. In this regard, RNAO's Best Practice Guideline program's goals very much align with our own. The recommendations in the guideline align well with the 2017 Falls Prevention Required Organizational Practice. We are also thrilled to see the promotion of person-and family-centred care throughout the guideline.

We commend you on the development of *Preventing Falls and Reducing Injury from Falls, Third Edition*; a resource which will help nurses and other health-care providers provide high quality care across a range of health-care settings. We are proud to support your work and believe that together, Accreditation Canada and RNAO are improving the quality of health-care across the country.

Congratulations on this important work.

Sincerely,

Leslee J. Thompson
Chief Executive Officer
Accreditation Canada and Health Standards Organization (HSO)

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Endorsements

August 9, 2017

Doris Grinspun, RN, MSN, PhD, LLD(hon), O.ONT
Chief Executive Officer
Registered Nurses' Association of Ontario (RNAO)
158 Pearl Street, Toronto, Ontario M5H 1L3

Dear Dr. Grinspun,

On behalf of the Canadian Geriatrics Society (CGS), I am pleased to provide an endorsement of the Registered Nurses' Association of Ontario's evidence-based clinical best practice guideline, *Preventing Falls and Reducing Injury from Falls, Third Edition*.

As you know, CGS promotes excellence in the medical care of older Canadians. We promote a high standard of research in the field of geriatrics/gerontology, and aim to improve the education provided to Canadian physicians on aging and its clinical challenges. Furthermore, we disseminate Canadian research and knowledge on clinical care of older patients to physicians with an interest in gerontology, medical students, residents, fellows and other practitioners and researchers in the field of aging. Recognizing that falls is an important topic that affects older adults, CGS appreciates the significance of a clinical practice guideline on this topic that will help standardize practices and improve care for older adults and others who are at increased risk of falls.

This new edition guideline aligns with our mandate to promote excellence and share best practices among the medical community. We particularly appreciate that it emphasizes the importance of interprofessional collaboration and education throughout health-care organizations. Interprofessional care is important in all health-care settings to enhance health outcomes and client experiences, reduce costs and improve the work environment for all care providers.

This comprehensive guideline will be useful, not only for nurses, but for all practitioners and organizations who are committed to the health and well-being of Canadians. Thank you!

Sincerely,

Frank Molnar
MSc, MDCM, FRCPC
President, CGS

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August 21, 2017

Doris Grinspun
Chief Executive Officer
Registered Nurses' Association of Ontario (RNAO)
158 Pearl Street
Toronto ON M5H 1L3

Dear Dr. Grinspun:

Thank you for your request to endorse your important new publication, *Preventing Falls and Reducing Injury from Falls, Third Edition*. All of us here at the Canadian Patient Safety Institute (CPSI) share with the RNAO a dedication to evidence-informed approaches to investigation and leadership and to sharing innovative health practices, resources, and tools. On behalf of CPSI, I would like to endorse your guideline, and commend the hard work that created this important document.

This RNAO guideline outlines a broad range of strategies to promote quality care and patient safety across all sectors. The practice recommendations encourage a collaborative, person-centred approach to preventing falls and injuries from falls. The education recommendations include important topics that will support consistent, safe, quality care. The policy and organization recommendations outline the fundamental role of organizations in ensuring that the necessary structures are in place for successful program implementation.

It is particularly encouraging to me to hear that safety improvement work is reaching practitioners in acute care, primary care, long term care, and individuals concerned about improving healthcare in Canada. When people from across the healthcare spectrum come together, we really can improve patient and health outcomes.

This evidence-based best practice guideline is an excellent resource for organizations across Canada, and we are pleased to support it.

Sincerely,

Chris Power
CEO, Canadian Patient Safety Institute

Safe care…accepting no less
Soins sécuritaires…n'acceptons rien de moins

www.patientsafetyinstitute.ca
www.securitedespatients.ca

Doris Grinspun, RN, MSN, PhD,
LLD(hon), O.ONT
Chief Executive Officer
Registered Nurses' Association of
Ontario (RNAO)
158 Pearl Street,
Toronto, Ontario M5H 1L3
Canada

31 August 2017

Dear Doris,

On behalf of the International Council of Nurses (ICN), I am pleased to endorse the Registered Nurses' Association of Ontario's (RNAO) clinical best practice guideline *Preventing Falls and Reducing Injury from Falls, Third Edition*. I commend RNAO on this very important work to enhance the leadership capacity of nurses and other health-care providers to effectively prevent falls and fall injuries in all adults across a range of health-care settings.

As you know, ICN is a federation of more than 130 national nurses' associations, representing more than 16 million nurses worldwide. Operated by nurses and leading nurses internationally, ICN works to ensure quality nursing care for all, sound health policies globally, the advancement of nursing knowledge, the presence worldwide of a respected nursing profession, and a competent and satisfied nursing workforce.

RNAO's guidelines are resources that support ICN's objectives. I am confident that RNAO's *Preventing Falls and Reducing Injury from Falls, Third Edition* will enable nurses at all levels to deliver evidence-based, person-centred care to people across all sectors, nationally and internationally.

Congratulations on this excellent work!

Best regards,

Annette Kennedy
President
International Council of Nurses

International Council of Nurses

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August 23, 2017

Doris Grinspun, RN, MSN, PhD, LLD(hon), O.ONT
Chief Executive Officer
Registered Nurses' Association of Ontario (RNAO)
158 Pearl Street, Toronto, Ontario M5H 1L3

Dear Dr. Grinspun,

As you know, Osteoporosis Canada is the only national organization serving people who have, or are at risk for, osteoporosis. Our organization works to educate, empower and support individuals and communities in risk-reduction and treatment of osteoporosis. As such, we are pleased to offer our endorsement of your newest edition of the Registered Nurses' Association of Ontario best practice guideline on the topic fall prevention and injury reduction. We believe that *Preventing Falls and Reducing Injury from Falls, Third Edition* is a high quality evidence-based guideline. It will be a helpful resource for nurses and others who work in various health-care settings across Canada.

The overall themes and the recommendations in this best practice guideline are very much aligned with our own guiding principles. We appreciate that RNAO refers to Osteoporosis Canada throughout the guideline as a credible source of information specifically about osteoporosis. The guideline is in keeping with our values of accurate, evidence-based information and care; collaboration in a united effort; inclusivity, integrity; and ethical decision-making and actions.

Attached please find comments received from our Osteoporosis Canada's Guidelines committee that you may find helpful. In general, they agreed there was a benefit in encouraging fall prevention and fall reduction. An executive summary at the beginning of this document would be helpful.

Congratulations on the development of this new guideline which we are proud to support.

Warm regards,

Dr. Famida Jiwa, MHSc, CHE, DC, BSc(Hons)
President & CEO
Osteoporosis Canada

Heather McDonald-Blumer,
Chair of the OC Guidelines Committee
Osteoporosis Canada

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9 August 2017

Doris Grinspun, RN, MSN, PhD, LLD(hon), O.ONT
Chief Executive Officer
Registered Nurses' Association of Ontario
158 Pearl Street, Toronto, Ontario M5H 1L3

Dear Doris,

The Sigma Theta Tau International (STTI) Honor Society of Nursing is delighted to endorse the Registered Nurses' Association of Ontario's (RNAO) Clinical Best Practice Guideline - *Preventing Falls and Reducing Injury from Falls, Third Edition*. I congratulate RNAO on this very important work to enhance the leadership capacity of nurses and other health-care providers to effectively prevent falls and injuries from falls in health-care settings across Canada and internationally.

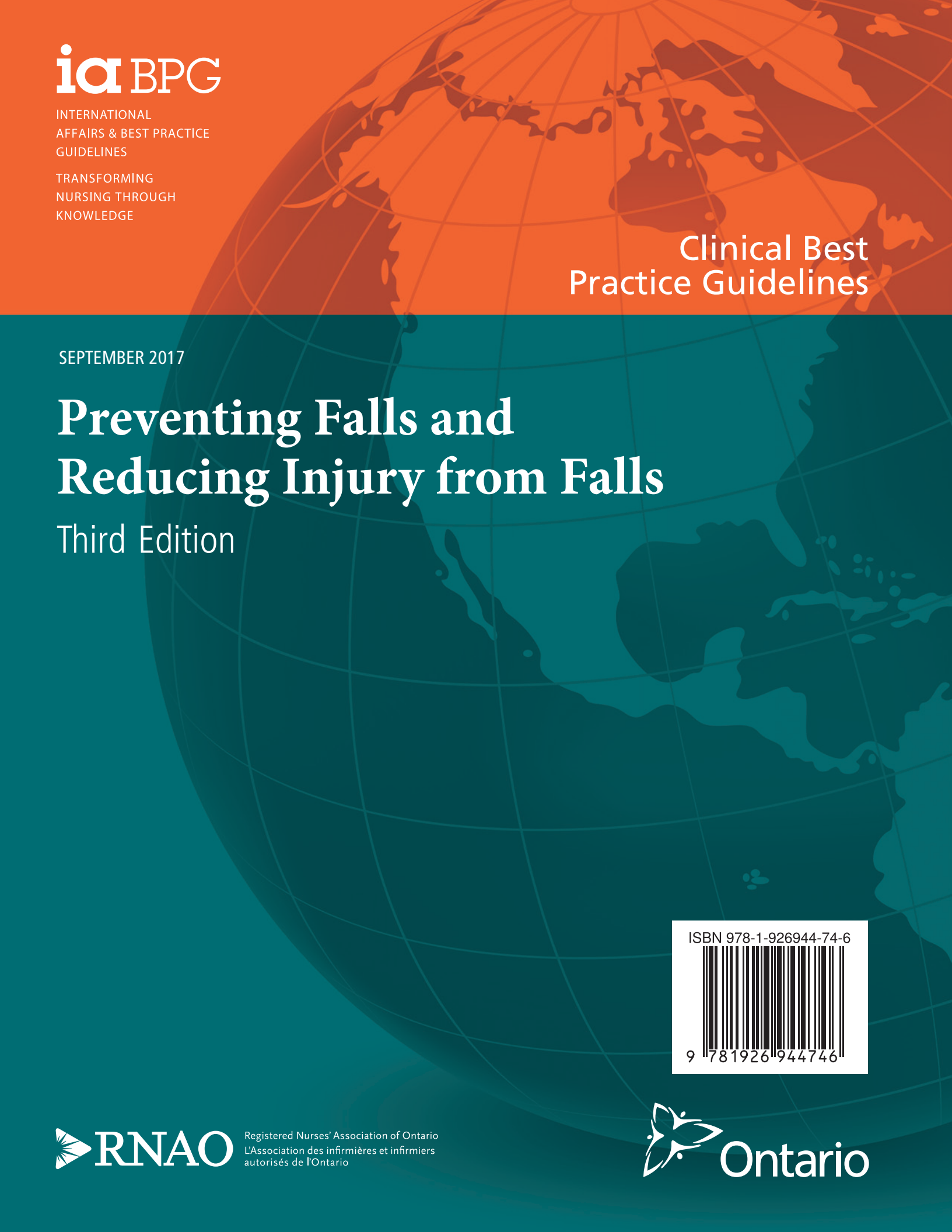
As you know, STTI is dedicated to advancing world health and celebrating nursing excellence in scholarship, leadership, and service. With more than 135,000 active members from over 90 countries, we promote products and services that focus on education, leadership, career development, evidence-based nursing, research, and scholarship. RNAO's new edition of the guideline on the topic of fall prevention and injury reduction will support nurses in all roles as they lead implementation of evidence-based, high-quality care, across all sectors.

Thank you for your leadership in developing this impressive work.

Sincerely,

Cathy Catrambone

Cathy Catrambone, PhD, RN, FAAN
2015-2017 President
Sigma Theta Tau International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