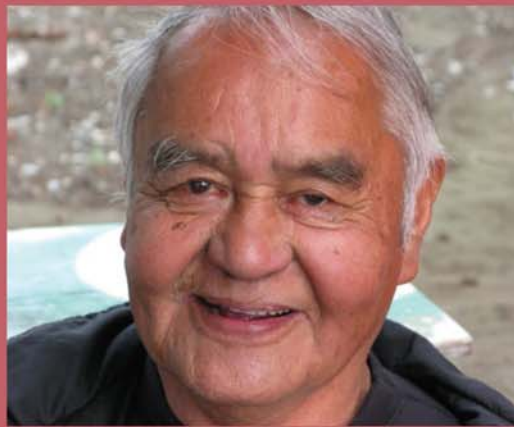


# Falls and Related Injuries in Residential Care: A Framework & Toolkit for Prevention



**BC INJURY** research and prevention unit

**CEMIA** CENTRE of EXCELLENCE  
on Mobility, Fall Prevention  
and Injury in Aging



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## Executive Summary

On average, approximately 1.7 falls occur per person-year in long-term care facilities (Rubenstein, 2006). Hip fractures occur almost four times more often in residential settings compared to the private home environment (Norton et al., 1998), and less than 15 percent of facility residents who sustain a hip fracture regain pre-injury ambulation status (Folman, Gepstein, Assaraf, & Liberty, 1994). In addition, approximately 20 percent of all fall-related deaths among older adults occur among the less than 8 percent of older adults living in RC settings (Health Agency of Canada, 2005; Rubenstein, 1997).

Evidence shows that falls can be prevented in residential settings through the application of a multifactorial strategies offered by a qualified multidisciplinary team (Cameron et al., 2010). Key strategies in a multifactorial approach include staff education, environment modifications, hip protector use, medication reviews, optometry, podiatry, goal setting, resident fall prevention training, inspection and repair of assistive equipment, and exercise (Becker et al., 2003; Becker & Rapp, 2010; Jensen, Nyberg, Gustafson, & Lundin-Olsson, 2003; Ray et al., 1997).

Single interventions shown to be effective include medication review (Zermansky et al., 2006), post-fall assessments (Bouwen, De Lepeleire, & Buntinx, 2008; Rubenstein, Robbins, Josephson, Schulman, & Osterweil, 1990), additional supervision (Shimada, Tiedemann, Lord, & Suzuki, 2009; Donoghue, Graham, Mitten-Lewis, Murphy, & Gibbs, 2005), and vitamin D supplementation (Bischoff et al., 2003; Cameron et al., 2010). Exercise has shown mixed results, with a study by Sakamoto et al (2006) reporting significant reductions in falls using a program that involved standing on one foot for one minute (with support if necessary) and then standing on the other foot for one minute, repeated three times, three times each day. Exercise has also been linked to falls prevention through improvements in mobility (Graafmans, Lips, Wijnhuizen, Plujim, & Bouter, 2003; Mulrow et al., 1994). However, more evidence is needed on the application of this evidence into routine practice.

Approximately 25 percent of all falls in RC result in injury requiring medical attention by a physician (Becker & Rapp, 2010). Fall-related fractures occur most frequently during the first month after admission or readmission (Becker & Rapp). Strategies for the prevention of injury due to a fall include the use of hip protectors (Parker, Gillespie & Gillespie, 2005; Kannus et al., 2000) and through the assessment and modification of individual fall risk factors conducted in the first few days after admission and after a fall (Becker & Rapp).

The purpose of this report is to facilitate the translation of fall prevention evidence into practice through the presentation of a Public Health Framework to fall prevention. A Public Health Framework is evidence-based, relying on a careful analysis of the problem and its causes in order to develop practical and effective solutions that are integrated into routine care. It is a staged approach, consisting five program planning steps that build upon each other in a dynamic process

and that exist within a social and policy context that is influenced by the seniors who are at risk, their families and care providers, and by current policies and legislation. The five stages described in this report are:

1. Defining the Problem;
2. Identifying the Risk;
3. Implementing Best Practices;
4. Translating the Knowledge; and
5. Evaluating the Program.

Together, these steps represent a systematic approach to fall prevention that relies on organizational commitment, leadership, staff training, and collaboration among researchers, policy makers and practitioners for successful and sustainable programming for the identification and reduction of risk.

## Introduction: Fall Prevention in Residential Care

### Background

Falls are the leading cause of injury-related deaths and hospitalizations for seniors in British Columbia (BC). Each year more than 200,000 BC seniors will experience one or more falls, resulting in over 10,000 hospitalizations and more than 800 direct and indirect deaths (BC Ministry of Health, 2006). Falls among older people often result in disability, chronic pain, loss of independence, reduced quality of life and even death.

Falls and related injuries are of particular concern among older adults living in residential care (RC) settings. Our rapidly aging population is putting demands on the limited number of RC beds in British Columbia and across Canada. The result is that adults who are now admitted to RC facilities tend to have more complex health challenges, such as advanced dementia, multiple chronic health conditions and limited mobility. These same trends also reflect a population that is at greater risk of falling and sustaining a fall-related injury. In addition, many RC facilities built in prior decades were not designed to meet the needs of this frailer population and aging physical environments are proving to be another contributor to fall risk. The challenge is to maintain staffing levels, staff composition and skill sets that parallel these changes, with the implementation of evidence-based fall prevention by trained care providers recognized as a priority issue.

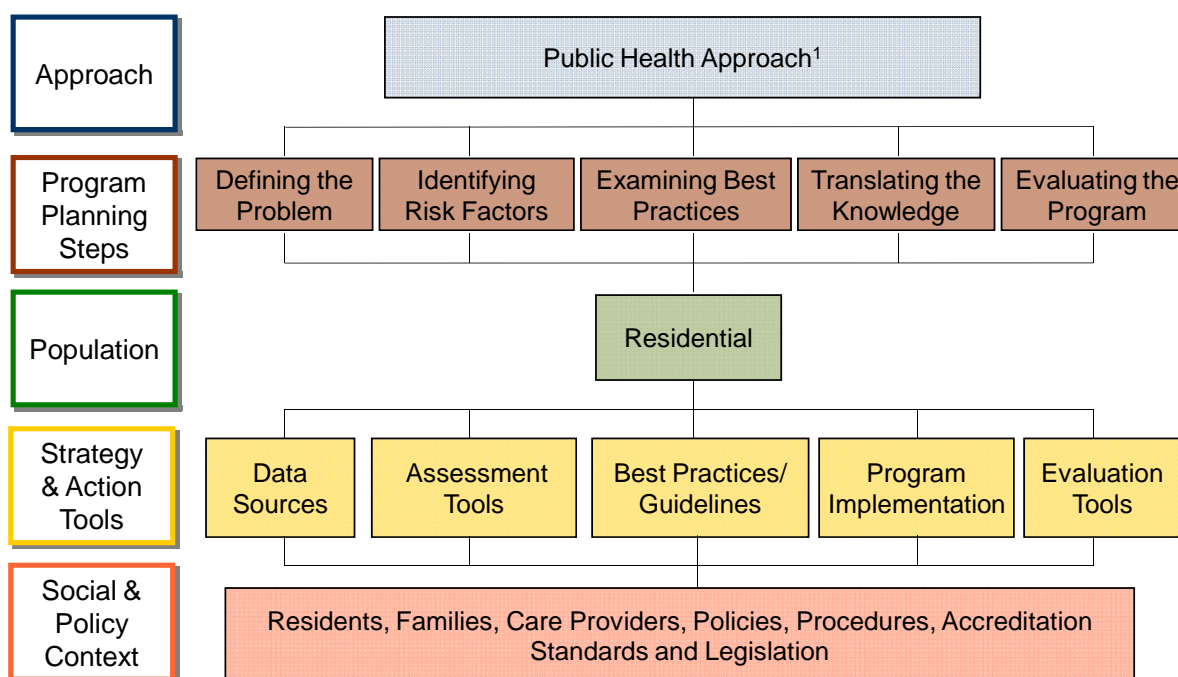
On average, approximately 1.7 falls occur per person-year in long-term care facilities (Rubenstein, 2006). This translates into approximately one fall every other day in a 100-bed RC facility. Compared to older adults who live in the community, those in RC fall two to four times more often, and are twice as likely to be injured (Lord et al., 2003). Hip fractures occur almost four times more often in residential settings compared to the private home environment (Norton et al., 1998), and less than 15% of facility residents who sustain a hip fracture regain pre-injury ambulation status (Folman, Gepstein, Assaraf, & Liberty, 1994). Approximately 20% of all fall-related deaths among older adults occur among the less than 8% of older adults living in RC settings (Public Health Agency of Canada, 2005; Rubenstein, 1997).

There is good evidence supporting the predictability and prevention of falls among seniors in the community (Gillespie et al., 2009). However, less is known about the prevention of falls among residents of long-term care facilities. Existing studies include those employing a multifactorial approach of staff education, environment modifications, hip protector use, medication reviews and exercise (Becker et al., 2003; Jensen et al., 2003; Ray et al., 1997; Scott et al., 2008). Vitamin D and calcium supplements have shown promise as a potential strategy for falls prevention (Bischoff et al., 2003) and exercise has been linked to falls prevention through improvements in mobility (Graafmans et al., 2003; Mulrow et al., 1994). However, there is little evidence of the application of this evidence into routine practice. The purpose of this report is to facilitate the translation of evidence into practice through the application of a public health framework to fall prevention.

### Public Health Framework

This report makes the case for the application of a Public Health Framework to fall and injury prevention in RC. This approach was first applied in the Canadian Falls Prevention Curriculum (Scott et al., 2007; Scott et al., 2009)– a course that is recommended for all those responsible for the design and implementation of long term care fall prevention planning. The Public Health framework is evidence-based, relying on a careful analysis of the problem and its causes in order to develop practical and effective solutions that are integrated into routine care. As shown in Figure 1, it is a staged approach, consisting five program planning steps that build upon each other in a dynamic process and that exist within a social and policy context that is influenced by the seniors who are at risk, their families and care providers, and by current policies and legislation.

**Figure 1: A Public Health Framework to Fall and Related Injury Prevention**



<sup>1</sup> Adapted from Scott, V. et al (2007). Canadian Falls Prevention Curriculum, October 2009

The following is a description of sections of the Public Health Framework, including the program planning steps, the target population, strategies and actions, and the social and policy context.

### *Program Planning Steps*

#### **1. Defining the Problem**

To properly define the problem of falls and related injuries in RC there must be evidence of an assessment of the scope and nature problem for the individual residents and the setting in general. The scope gives you information about the size of the issue. The nature tells you who are affected, where the problem occurs and what the problem looks like.

#### **2. Identifying Risk Factors**

There must be evidence of an assessment of individual resident and facility-wide fall risk factors. Individual assessment should occur on resident admission and following a resident fall, and following a significant change in health status.

#### **3. Examining Best Practices**

There must be evidence of best practice interventions that are client centered and address the risk factors found for individual residents and for the facility in general.

#### **4. Translating the Knowledge**

There must be evidence of interventions being applied in the form of resident care plans and facility-wide strategies. Care planning should include participation from multidisciplinary staff, residents and families for development, implementation, and evaluation.

#### **5. Evaluating the Program**

There must be evidence of ongoing evaluation of resident and facility-wide care plans, with monitoring and reporting of falls and fall-related injuries for the facility. Changes in the program planning steps should reflect the evaluation findings.

### *Target Population*

This Framework and Toolkit are designed for application in, “residential care for persons with chronic or progressive conditions, primarily due to the aging process”<sup>9</sup> (p. 6), also known as long term care, nursing homes or extended care.



### *Strategy and Action Tools*

Tools are needed to bring the five planning steps alive. Recommended strategies and actions for implementing the five public health steps for fall prevention are found in the linked files of Tools and Resources listed in the Appendix of this report under the following five headings:

- 1) Data Sources
- 2) Assessment Tools
- 3) Best Practices and Guidelines
- 4) Program Implementation
- 5) Evaluation Tools

### *The Social and Policy Context*

For effective implementation of fall prevention programs, consideration must be given to the social and policy context. This includes an examination of the meaning of a fall for the resident and their family, the setting's perception of the problem, characteristics of the setting that enable or inhibit program planning, and the available resources. A fall prevention plan should also reflect relevant sections of legislation, regulation and accreditation standards that the facility must adhere to, as each of these elements has the potential to influence the timing and success of intervention strategies.

A policy that has a major influence on fall prevention in BC and across Canada is the **Accreditation Canada** Required Organizational Practice (ROP) implemented in 2008 under Patient Safety Area #6 (Accreditation Canada, 2008). This ROP is designed to reduce the risk of injuries resulting from client falls, through the following required practices:

1. Implement and evaluate a fall prevention strategy to minimize the impact of client falls.
2. Tests for compliance:
  - The team has implemented a fall prevention strategy.
  - The strategy identifies the population(s) at risk for falls.
  - The strategy addresses the specific needs of the populations at risk for falls.
  - The team evaluates the fall prevention strategy on an ongoing basis to identify trends, causes and degree of injury.
  - The team uses the evaluation information to make improvements to its fall prevention strategy.

In addition, in BC, the following section from the **Residential Care Regulations** for British Columbia (BC Ministry of Healthy Living and Sport, 2009), implemented in 2009 applies to all Licensed BC Residential Care Facilities outlines the following required practices:

1. Fall prevention care plans for persons who receive long term care or who may be prone to falling that must address:
  - an assessment of the nature of the risk of falling presented by the person in care,
  - a plan for preventing the person in care from falling, and
  - a plan for following up on any fall suffered by a person in care (BC Ministry of Healthy Living and Sport, 2009).
  
2. Written policies and procedures must include:
  - an assessment of the nature of risks that may result in persons in care falling in the community care facility,
  - a plan for preventing persons in care from falling, and
  - a plan for responding to a fall suffered by a person in care, including steps to be taken to ensure the health and safety of the person in care who has fallen and to prevent subsequent falls by the person in care (BC Ministry of Healthy Living and Sport, 2009).
  
3. Licensee must keep a record of:
  - minor accidents, illnesses and medication errors involving persons in care that do not require medical attention and are not reportable incidents;
  - unexpected events involving a person in care;
  - reportable incidents involving a person in care (BC Ministry of Healthy Living and Sport, 2009).

[Note: A fall is defined in the Residential Care Regulations as: “a fall of such seriousness, experienced by a person in care, as to require emergency care by a medical practitioner or nurse practitioner, or transfer to a hospital” (BC Ministry of Healthy Living and Sport, 2009)]

### **Framework and Toolkit Origins and Intended Audience**

The impetus for this report, and the recommendations included in the knowledge translation section, come directly from the Residential Care Fall Prevention Summit held in Victoria BC on November 5-6, 2009. This pivotal two-day meeting of over 100 health care practitioners, policy makers and researchers focused on the collaborative development of fall prevention goals, strategies and action for practical, evidence-based solutions for the assessment and reduction of fall risk among older adults in residential care.

The intended audience is those who operate or manage residential care facilities, those who design policies that guide the operation of residential care facilities, and for the staff, family and residents of residential care.

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## Chapter 1: Defining the Problem

### Using Data to Understand, Monitor and Evaluate Falls and Fall Prevention Initiatives in Residential Care

#### Introduction

The systematic collection, analysis, interpretation and dissemination of data are fundamental to defining the problem of falls and fall-related injuries in residential care (RC). For best effect, these steps should be conducted using a standardized method that will allow for comparisons across similar sites and over time. The benefits of the presentation of sound data include the ability to develop a business case that supports the investment of resources for interventions and the ability to monitor and evaluate the effectiveness of interventions. In addition, data on the location, time and nature of all falls allows for strategic, facility-wide prevention planning. This chapter presents an example of the use of data to describe the scope and nature of the problem at a province-wide and regional level in B.C. Other data sources that are recommended for use in defining the problem of falls and related injuries at a facility level in RC in B.C. include the Patient Safety Learning System, the BC Fall Report and the InterRAI Minimum Data Set (MDS) – for a description of these and other data sources see the Took Kit accompanying this report under the section on “Data Sources and Tools”. The following is a presentation of data on the direct and indirect fall-related death rates, hospital utilization rates, hospital costs, and severity of injuries among seniors living in residential care facilities.

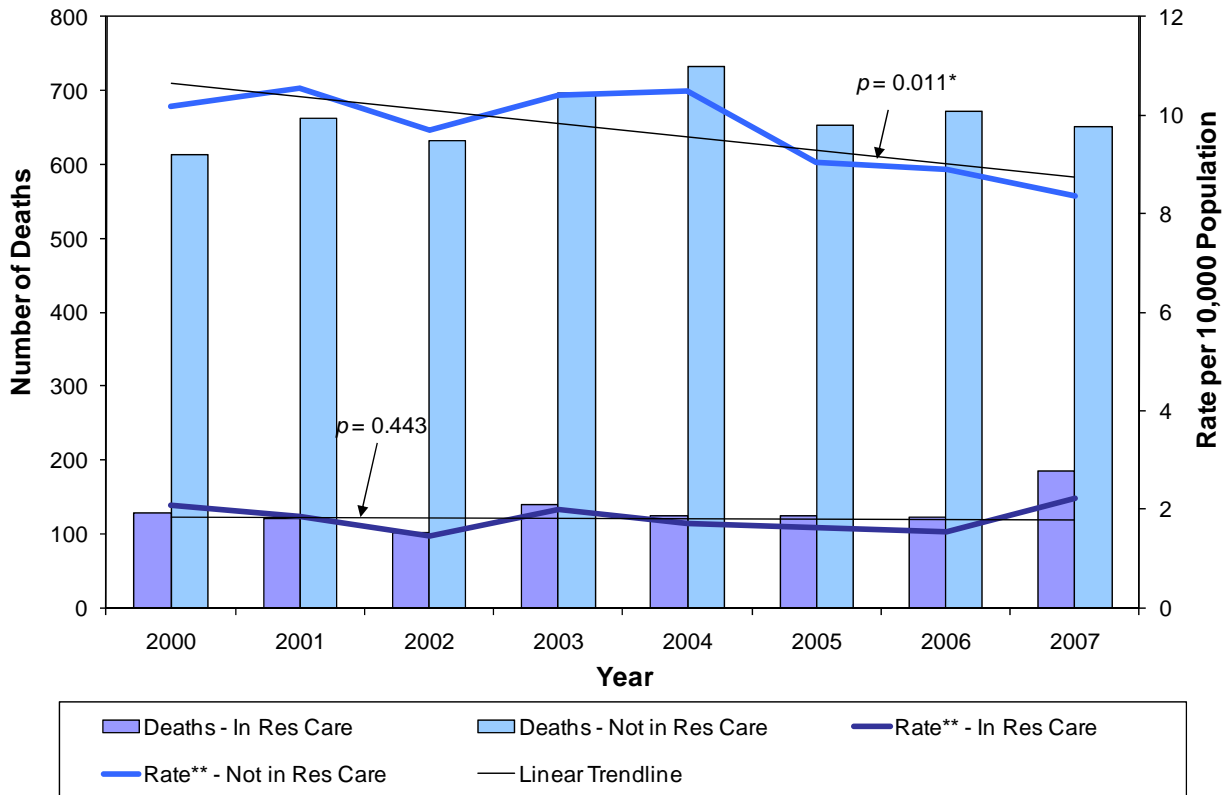
#### British Columbia Data – Falls and Fall-related Injuries among Seniors in Residential Care

##### *Mortality Data*

In 2007, approximately 5.6% (n= 33,978) of B.C.'s seniors (n=601,676) lived in residential care. However, of the 836 fall-related deaths that occurred in 2007, 185 (22%) occurred among seniors living in residential care (Quantum Analyzer, 2009). This B.C. statistic is slightly higher compared to national and U.S. statistics, which show that approximately 20% of all fall-related deaths among older adults occur among the 8% of older adults living in residential care settings (Public Health Agency of Canada, 2005; Rubenstein, 1997).

Figure 2 below shows the fall-related direct and indirect death rates from the years 2000 to 2007 among seniors in residential care, compared to seniors who do not live in residential care. While there is a statistically significant decline in the death rate among seniors who do not live in residential care, there is no significant decline in the rate among seniors who lived in residential care between these years.

**Figure 2. Direct and Indirect Deaths Due to Falls Among Seniors in Residential Care and Seniors not in Residential Care, B.C., 2000 to 2007**



\* Statistically significant ( $p < 0.05$ ).

\*\* Age-Standardized to B.C. 1991 population.

Notes:

Direct cause of death = the underlying cause of death or what the person died of.

Indirect cause of death = contributing, associated, or antecedent causes to the underlying cause of death.

Falls = ICD-9 E880 - E888, ICD-10 W00 - W19.

Source: B.C. Vital Statistics Agency; Vital Statistics mortality data produced by Health Sector IM/IT Informatics group, June 2009.

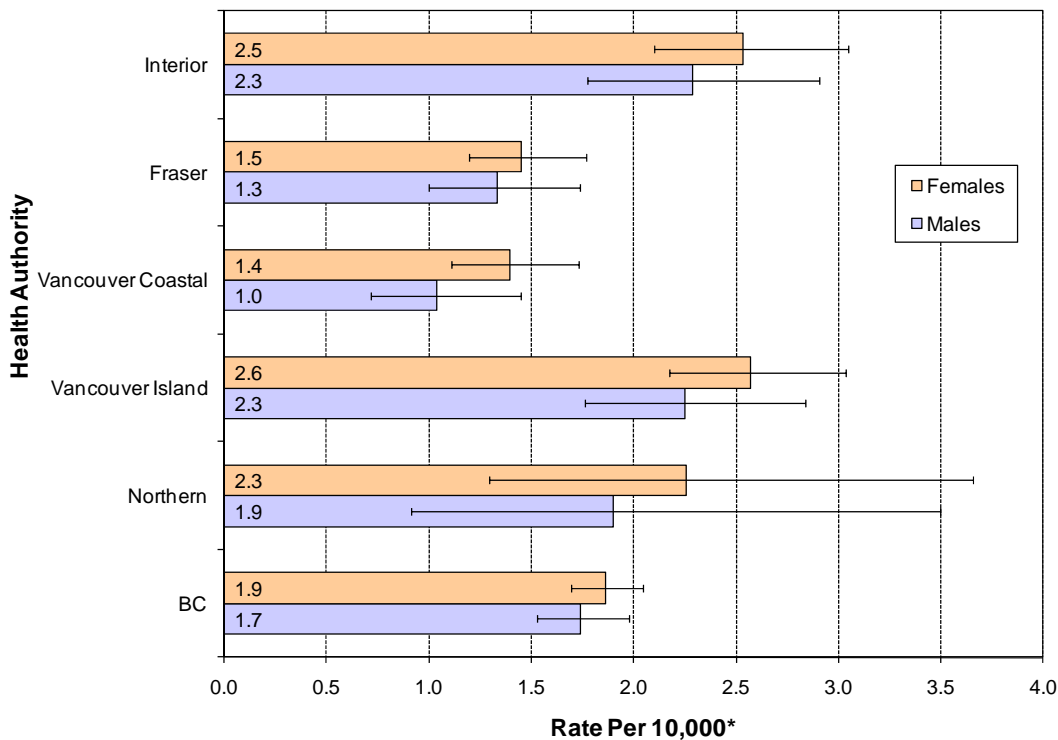
Prepared by: Population Health Surveillance and Epidemiology, Ministry of Healthy Living and Sport, 2009.

Figure 3 shows a breakdown by gender and health authority of direct and indirect death rates due to a fall among seniors living in residential care between the years 2003 and 2007. Females in residential care had a higher rate of death during these years than their male counterparts in all five health authorities.

When comparing fall-related death rates between health authorities, this graph shows that Interior, Vancouver Island and Northern Health Authorities have higher rates for both males and females

than the overall B.C. rates. However, based on the confidence intervals, only the female rates for both Interior and Vancouver Island are statistically significantly higher than B.C.'s female rate. Fraser and Vancouver Coastal Health Authorities have lower rates than B.C.; however, only the Vancouver Coastal Authority's rate for males is statistically significantly lower than B.C.'s during these years. More investigation is needed to determine the factors contributing to the significant differences in fall-related rates for deaths within regions and between genders.

**Figure 3. Direct and Indirect Death Rates Due to Falls Among Seniors in Residential Care, by Gender and Health Authority, B.C., 2003-2007**



\* Age-Standardized to B.C. 1991 population, with 95% Confidence Intervals.

Notes:

Direct cause of death = the underlying cause of death or what the person died of.

Indirect cause of death = contributing, associated, or antecedent causes to the underlying cause of death.

Falls = ICD-9 E880 - E888, ICD-10 W00 - W19.

Source: B.C. Vital Statistics Agency; Vital Statistics mortality data produced by Health Sector IM/IT

Informatics group, June 2009.

Prepared by: Population Health Surveillance and Epidemiology, Ministry of Healthy Living and Sport, 2009.

*Morbidity Data*

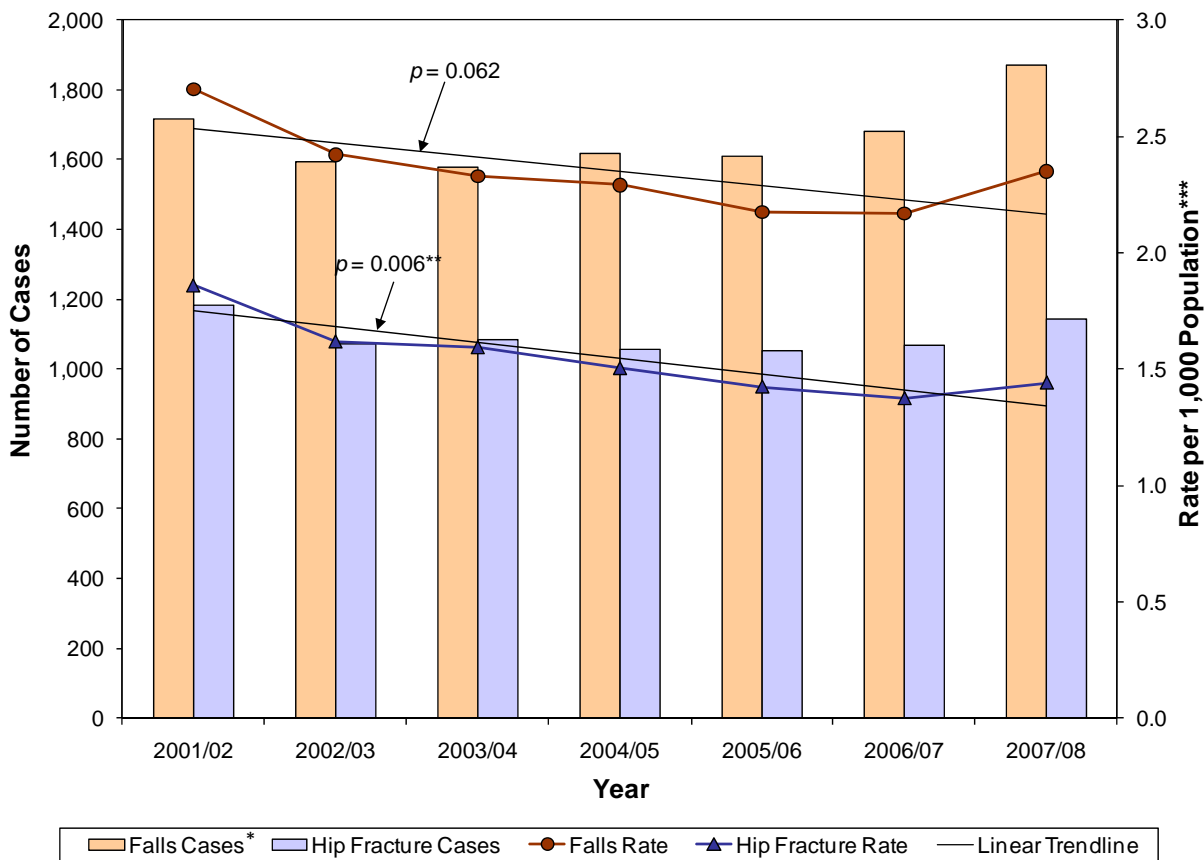
In terms of hospital data, approximately 17% of fall-related hospitalizations among seniors (1,871/10,880) occur among those who live in residential care. Similar to death cases, the relative proportion of hospital cases among patients coming from residential care is disproportionately high,



considering that only 5.6% (33,978/601,676) of B.C. seniors lived in residential care facilities in 2007.

Figure 4 compares all fall-related hospital cases and rates (including hip fractures) among seniors in residential care to fall-related hip fracture hospital cases and rates among between the years 2001/02 – 2007/08. Hip fractures accounted for approximately two-thirds of the fall-related hospitalizations during the earlier years, and this proportion decreases to approximately 40% of fall-related hospitalizations by 2007/08. The p-value of 0.006 for the rate of fall-related hip fractures during these years indicates that the decline for hip fractures alone is statistically significant. However, for seniors in residential care, the declining rate of fall-related hospitalizations for all causes, including hip fractures, is not quite statistically significant (p=0.062) and is starting to show an upward trend for 2006/07 and 2007/08.

**Figure 4. Fall-Related and Fall-Related Hip Fracture Hospital Cases and Rates Among Seniors in Residential Care, Ages 65+ Years, B.C., 2001/02 to 2007/08**



\* Includes hip fractures.

\*\* Statistically significant (p < 0.05).

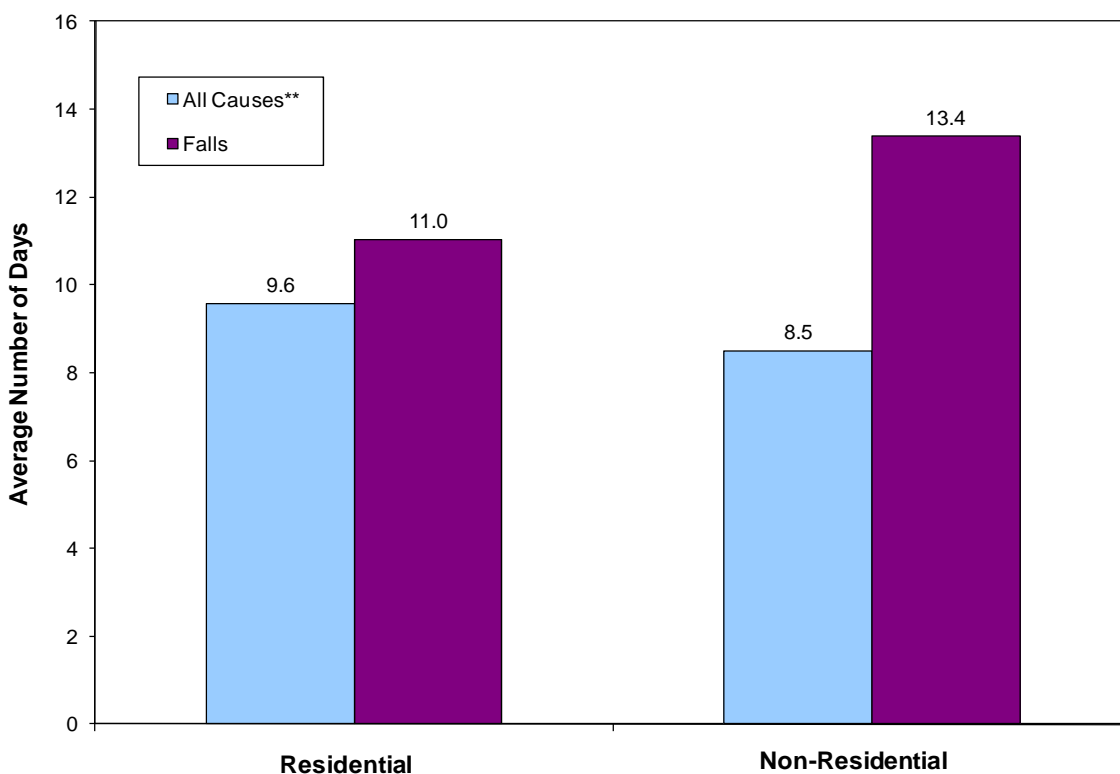
\*\*\* Standardized to the B.C. 1991 population.

Source: Acute/rehab. separations from the 2001/02 to 2007/08 Canadian Institute of Health Information Discharge Abstract Dataset.

Prepared by: Population Health Surveillance and Epidemiology, Ministry of Healthy Living and Sport, July 2009.

Another indicator of the impact of seniors' fall-related injuries on health care delivery and cost is average length of stay (ALOS) in hospital. Figure 5 compares fall-related acute care ALOS to ALOS for all other causes of hospitalization (excluding falls) for seniors from both residential and non-residential care settings. As shown, seniors coming from non-residential and residential care settings who are hospitalized for fall-related injuries have a longer ALOS than those who are hospitalized for all other causes.

**Figure 5. Average Length of Hospital Stay, Acute and Rehab. (AR)\* Levels of Care, All Causes and Fall-Related Hospitalizations, Seniors in Residential Care and Seniors not in Residential Care, B.C., 2007/08**



\* AR: Acute and Rehab are distinct levels of care. For each hospitalization, whether Acute or Rehab, a proportion of the total days may be designated alc days (alternate level of care). The remainder of the total days are not alc and the Ministry of Health Services has created a variable - ar days - to represent this (Source: Sofiva, Ministry of Health Services).

\*\* Excluding falls.

Source: Acute/rehab. separations from the 1996/97 to 2007/08 Canadian Institute of Health Information Discharge Abstract Dataset.

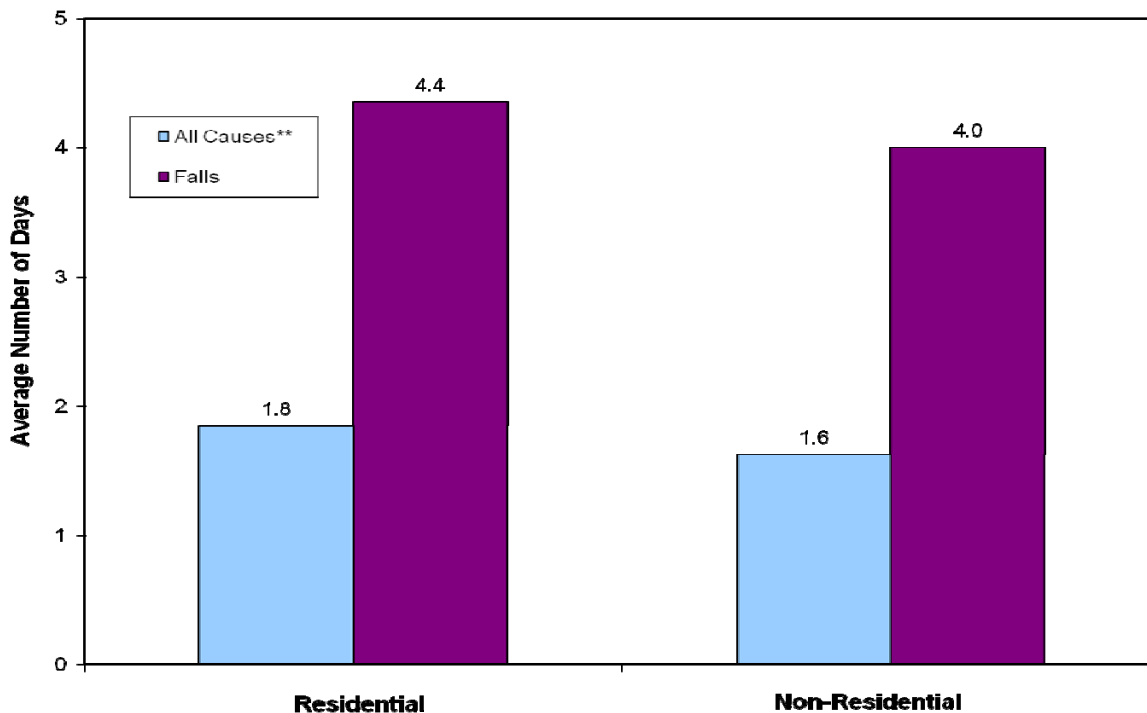
Prepared by: Population Health Surveillance and Epidemiology, Ministry of Healthy Living and Sport, November 2009.

After the acute care/rehabilitation (AR) treatment phase is complete, any remaining days spent in hospital are known as Alternative Levels of Care (ALC) days. Figure 6 shows ALC days for residential care and non-residential care patients who are hospitalized for falls compared to all other causes. For patients with fall-related injuries, a disproportionate number of hospital days are spent in ALC, compared to all other causes of hospitalization. Among patients coming from residential care with fall-related injuries the Average Length of Stay (ALOS) in ALC is 4.4 days, and this is 2.4 times higher than ALOS for all other causes at 1.8 days. Similarly, among patients from non-residential care settings, fall-related ALOS is 2.5 times higher than for all other causes (4.0 days vs. 1.6 days respectively).

Patients in ALC occupy highly sought-after acute care beds, contributing to congestion throughout the health care system and subsequent costs to the health care system. According to the Canadian Institutes of Health Information (CIHI) (2009), almost 60% of ALC days related to hospitalization for an unintentional fall were for seniors waiting to be transferred into residential care. Other reasons for high ALOS in ALC among falls patients include:

- patient is awaiting transfer to another level of more appropriate care (complex continuing care, home care or other services);
- patient cannot return home because their home is not set up with the proper equipment;
- patient's caregiver may not be available;
- long-term care placement may involve a move to a different city (which may isolate them from family and friends);
- patient is in respite or convalescence.

**Figure 6. Average Length of Hospital Stay, Alternate Level of Care (alc)\* Levels of Care, All Causes and Fall-Related Hospitalizations, Seniors in Residential Care and Seniors not in Residential Care, Ages 65+ Years, B.C., 2007/08**



\* ALC (alternate level of care): A patient has finished the acute care phase of his/her treatment but remains in the acute care bed. However, ALC can be for reasons other than awaiting placement, such as convalescence and respite (Source: [Canadian Institute of Health Information Discharge Abstract Dataset 2008/09 Abstracting Manual: B.C. Section](#), p. 13-2). For each hospitalization, whether Acute or Rehab, a proportion of the total days may be designated alc days. The remainder of the total days are not ALC and the Ministry of Health Services has created a variable - AR days - to represent this.

\*\* Excluding falls.

Source: Acute/rehab separations from the 1996/97 to 2007/08 Canadian Institute of Health Information Discharge Abstract Dataset.

Prepared by: Population Health Surveillance and Epidemiology, Ministry of Healthy Living and Sport, November 2009.

## Conclusion

The data shown above are an example of how the issue of falls among seniors in residential care can be defined to demonstrate their significant contribution to injury-related deaths, hospitalizations and hospital days. Seniors living in residential care facilities are not only more susceptible to falling but also more susceptible to injury when they fall. These data show that there has been a significant decline in fall-related hip fractures among seniors living in residential care. This may be due the development of new technologies and prevention strategies, such as hip protectors, the implementation of evidence-based best practices and increased recognition of the severity of the issue for those living in residential care. While investigations are needed to better determine the

contributors to this downward trend, it is important to acknowledge the huge cost savings brought about by the impact of current practices. The direct hospital costs alone for each hip fracture is approximately \$18,500, with a total annual hospital costs for hip fractures among those in residential care of \$21 million in the year 2007/08.

Other impacts on the health care system include the total number of days spent in hospital for acute and rehab treatment for fall injuries and for the extra days spent on alternative levels of care. The alternative level of care days are often overlooked due to a focus on AR treatment and expenditures, but for falls in particular, these days place an extra economic burden on the health care system. With the new Accreditation Canada standards for fall prevention and the implementation of new residential care regulations in B.C. in October 2009, these data help to focus attention on this issue and are important measures to use in determining if changes are being made in policies and practices to reduce falls in residential settings.

Data presented here are at the provincial level, but it is also important to record and report facility-level data on the number and rate of all falls, fallers and fall-related injuries. In addition records are needed on the location, time, activities at the time of the fall and fall consequences for all falls. Timely feedback of this information to all staff members is important for strategic prevention planning.

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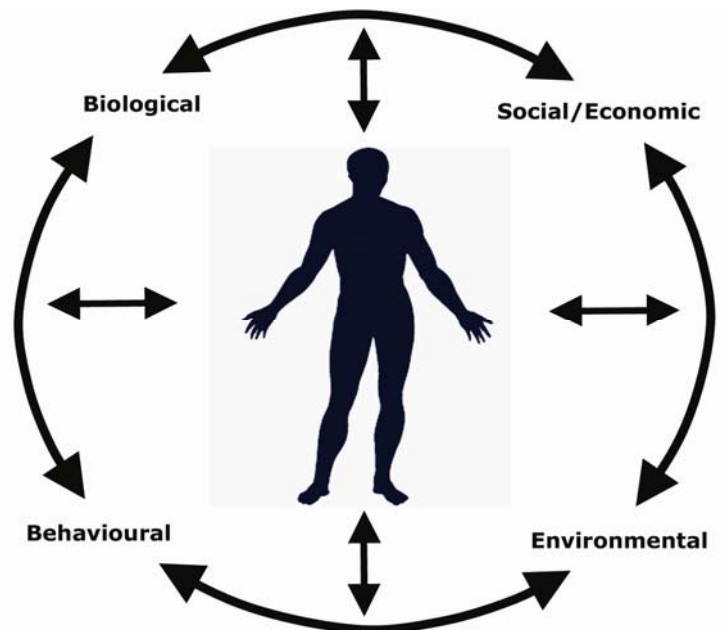
## Chapter 2: Identifying Risk Factors

Seniors living in residential care (RC) settings tend to be at a much greater risk for falls and related injuries than those living in the community, as demonstrated by at fall-related hospitalization rate in RC that is 3.6 times higher than the rate among older persons not living in residential care (Canadian Institutes of Health Information, 2009). This is primarily due to a higher prevalence of chronic health conditions that impact their balance, gait, vision and cognition but risk is also influenced by the physical environment and institutional practices. Falls and related injuries are often a determining factor for admission to residential facilities and those who are admitted are already at high risk of falling. The following is an overview of risk factors shown to be associated with a higher risk for falls and fall-related injuries among older adults in residential care settings and recommended steps for identifying the nature of the risk.

### Cumulative Risk for Falling

When examining the risk for falls in all settings it is important to understand that risk exists within a context of overlapping contributing factors. As with other injury prevention activities, it is often easy to get caught up in changing just one aspect of the picture, without considering the whole context. Figure 7 depicts the multifactorial nature of risk and the connection between biological, social and economic, environmental and behavioural risk factors for falls.

**Figure 7. Cumulative Fall Risk**



### Fall Risk in Residential Care

Factors found to be most highly associated with an increased risk of falling among the residential care population include:

- prior falls,
- muscular weakness,
- poor balance and gait deficits,
- poor vision,
- delirium,
- impaired cognition and attention deficits,
- wandering or impulsive behaviours,
- use of psychotropic medications,
- use of multiple medications,
- orthostatic hypotension,
- incontinence, urgency and nocturia,
- unsafe environments, and
- low staffing levels

(Fleming & Pendergast, 1993; Kannus et al., 1999; Kiely, Burrows, & Lipsitz, 1998; Leipzig, Cumming, & Tinetti, 1999a; Leipzig, Cumming, & Tinetti, 1999b; Lord et al., 2003; Tideiksaar, 2010).

While the evidence for the contribution of environmental contributors to fall is less strong than for the factors listed above, specific environmental hazards identified in residential care settings that put older persons with balance problems at increased risk of falling include:

- poorly designed or maintained buildings,
- lack of hand rails or grab bars,
- slippery floors (due to waxed or wet surfaces),
- poor lighting and glare from surfaces,
- lack of rest areas,
- beds that are too high,
- bed rails that do not allow for a 'kick space' beneath the bed,
- lack of storage for equipment that clutters rooms and hallways, and
- building codes and enforcement standards that do not reflect the needs of a frail population,

(Kallin, Jensen, Olsson, Nyberg, & Gustafson, 2004; Scott, Peck, & Kendall, 2004; Rapp, 2009; Scott et al., 2007).

### Risk Factors for Injurious Falls

Seniors who live in residential care are generally at greater risk of sustaining a fall-related injury due to a higher degree of frailty. A number of factors are shown to be more associated with falls that result in injury compared to those that do not, including the following:

*Osteoporosis:* Those with osteoporosis are at increased risk of a fracture due to a fall. A Canadian study found that a year after sustaining a low trauma fracture, less than 20 percent of these people had been diagnosed or treated for osteoporosis (Hajcsar, Hawker, & Bogoch, 2000). Osteoporosis Canada guidelines state that the risk for a fracture is increased when blood serum levels for 25-hydroxyvitamin D are below 75 nmol/L (Hanley et al., 2010).

*Quadriceps strength and postural sway:* A study comparing community-dwelling older persons who had not experienced a fall with those who fell and fractured their hip, found that poor quadriceps strength and the existence of postural sway were significant indicators for falls resulting in a hip fracture (Sherrington & Lord, 1998).

*Chronic conditions:* Certain chronic conditions are associated with higher fall-related injury rates compared to falls without injury, including a history of anemia, rheumatic disorders, symptoms of a stroke, cognitive impairment, users of psychotropic drugs, muscle weakness, balance and gait impairment and low body mass (Thapa, Brockman, Gideon, Fought, & Ray, 1996; Tinetti, 1987; Tinetti & Williams, 1997; Van Doorn et al., 2003).

*Gender:* Female gender is shown in a number of studies to be associated with higher injury rates compared to men (Sadigh, Reimers, Anderson, & Laflamme, 2004; Scott, Peck & Kendall, 2004; Van Doorn et al., 2003) and is likely a function of the higher rates of osteoporosis among women. Although men do not sustain as many injuries as women, they tend to sustain more fatal injuries (Nurmi, Lüthje, & Katajaet, 2004).

*Medications:* Use of benzodiazepine tranquilizers, psychotropic drugs and other sedatives is found to increase the risk of injury from a fall after controlling for age, gender and prior health care utilization (Kallin, Gustafson, Sandman, & Karlsson, 2004; Leipzig, Cumming, & Tinetti, 1999; Monane & Avorn, 1996; Whooley, et al., 1999).

*Flooring:* A study among hospital patients showed that 17 percent of falls on carpeted surfaces resulted in injuries, whereas 46 percent of falls on vinyl surfaces resulted in injuries (Healey, 1994). There is also growing evidence for the potential for fall-related fracture prevention through the use of compliant flooring (Robinovitch, 2009).

*New location:* The risk of a fall-related fracture in residential care was shown in a recent study (Becker & Rapp, 2010) to be greatest during the first month after admission, independent of gender, different care needs or site of the fracture. Fracture rates in the first



nine months after admission were approximately twice as high as those in the subsequent nine months (Rapp et al., 2008).

### **Fall Risk Assessment**

Fall risk assessment is an important step in identifying residents who are at high risk and in need of appropriate interventions to minimize their risk of a fall. Fall risk assessment tools (FRAT) and individualized care plans are recommended to reduce the incidence and severity of falls among residents (Rubenstein, Robbins, Josephson, Schulman, & Osterweil, 1990). A FRAT typically consist of a performance test of gait and balance or scoring system designed to reflect the cumulative effect of known risk factors for the purpose of identifying those at greatest risk for sustaining a fall (Scott, Votova, Scanlan, & Close, 2007). The information gathered is then used to tailor specific interventions to the identified risk factors.

It is important to choose a FRAT that is feasible and practical for use in residential care settings so that staff will adhere to it. Risk assessment should take place at the time of admission, after a fall and when residents experience a “change in condition”.

See the attached *Residential Care Fall and Fall-Related Injury Prevention Toolkit* for examples of validated assessment tools. Only those tools that have been tested in residential care settings are recommended for use by clinicians trained in their use. An important aspect of this training is to have different members of the staff complete a FRAT with the same residents and to compare the findings. Any discrepancies should be addressed to ensure that consistent findings occur regardless of who completes the tool.

The following steps for multifactorial fall risk assessment are recommended by the American and British Geriatric Associations (American Geriatrics Society, 2010):

Assessment should be performed by a clinician (or clinicians) with appropriate skills and training and should include the following:

1. Focused History
  - History of falls: Detailed description of the circumstances of the fall(s), frequency, symptoms at time of fall, injuries, other consequences
  - Medication review: All prescribed and over-the-counter medications with dosages
  - History of relevant risk factors: Acute or chronic medical problems (e.g., osteoporosis, urinary incontinence, cardiovascular disease)

## 2. Physical Examination

- Detailed assessment of gait, balance, and mobility levels and lower extremity joint function
- Neurological function: Cognitive evaluation, lower extremity peripheral nerves, proprioception, reflexes, tests of cortical, extrapyramidal and cerebellar function
- Muscle strength (lower extremities)
- Cardiovascular status: Heart rate and rhythm, postural pulse and postural blood pressure; and, if appropriate, heart rate and blood pressure responses to carotid sinus stimulation
- Assessment of visual acuity
- Examination of the feet and footwear

## 3. Functional Assessment

- Assessment of activities of daily living (ADL) skills including use of adaptive equipment and mobility aids, as appropriate
- Assessment of the individual's perceived functional ability and fear related to falling

## 4. Environmental Assessment

- Assessment of facility-wide environmental hazards such as flooring, handrails and grab bars, and lighting.
- Assessment of furniture including bed height, bed rails, and seating.

## Conclusions

Understanding which factors are highly associated with fall risk is important for targeting those most at risk and for tailoring prevention strategies to individual risk assessment profiles. Risk is typically cumulative with the chances of a fall and related injuries increasing exponentially with the number of risk factors present. Thorough assessment of residents' fall and injury risk should be conducted by trained clinicians on admission and after each fall to determine the nature of the risk in order to individualize prevention plans. In addition, facility-wide assessment should be conducted to determine organizational and environmental contributors to fall risk, with routine audits to track performance.

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## Chapter 3: Examining Best Practices

This chapter is a synthesis of the current literature on best practices for use by those who work in residential care facilities with older adults at risk for falling and sustaining an injury. The literature for this review and synthesis comes from the 2010 Cochrane Systematic Review fall prevention in residential and acute care facilities (Cameron et al., 2010), and from an independent search of randomized controlled trials and other studies of clinical relevance that are not analyzed in the Cochrane Review. Studies included are limited to those that tested interventions resulting in significant reduction in the incident of falls, fallers or fall-related injury among residents in long-term residential care facilities.

### Search Methods

The following criteria were applied for inclusion of articles in this review:

1. Reported results of studies conducted in residential care facilities;
2. Found statistically significant reductions in the rate of falls in the intervention group when compared with the control group;
3. Focused on falls, fallers and injury rates and not on intermediary outcomes such as improved balance or strength;
4. Investigated an intervention not reported in any other study;
5. Were conducted between 2000 and 2010;
6. Were published in English;
7. Reported the final analysis of randomized controlled trials;
8. Were scientifically rigorous trials where the intervention and control groups were almost identical in size and composition;
9. Did not meet criteria 7 and 8 but meet criteria 1 through 7 and were deemed clinically relevant.

The following three methods were used to search the literature using the above criteria:

1. A search of findings from the Cochrane Systematic Review of “Interventions for preventing falls in older people in nursing care facilities and hospitals” (Cameron et al., 2010). This database search revealed 15 relevant articles.
2. A search of academic library databases using the following search terms: (Falls OR injury) AND prevention AND trial AND ("residential care" OR "nursing home" OR "long-term care" OR "old people's home" OR "care home"). Academic library databases searched included Medline, CINAHL, Ageline, Academic Search, Health Source Nursing, Health Source Academic, Cochrane Central Register of Controlled Trials, and Cochrane Database of Systematic Reviews. This database search

revealed 210 potential articles that, upon closer review, produced an additional 7 articles not found in the Cochrane Review.

3. A gray literature internet search was also conducted using the same search terms used in the academic library search. Among other findings, this search identified a comprehensive set of guidelines on preventing falls and harm from falls in residents of care facilities in Australia (Australian Commission on Safety and Quality in Health Care, 2009). The articles listed in these guidelines revealed an additional 3 articles found to be relevant.

Together, the three search methods produced a total of 25 relevant articles that met the criteria. Fifteen of these came from the Cochrane Review, 7 from the academic library databases and 3 from the Australian guidelines on falls in residential care facilities. Four of the articles did not meet with criteria numbers 7 and 8 related to controlled trials, but were deemed to be clinically relevant. These included studies on volunteer companions, choice of footwear, flooring materials and adherence to fall prevention programs. The level of evidence for each study is provided in tables following the description of the findings for each study.

#### *Classification of Findings*

For ease of application of these findings in clinical settings, the article summaries are classified by those that represent single and multifaceted interventions and whether or not the intervention involves changes to staff practice or to changes among the residents. The following is an outline of these classifications:

1. Articles that reported findings from single intervention studies aimed at fall prevention:
  - a.) Where the intervention involved a single change to staff practice, or
  - b.) Where the intervention involved a single change to the daily lives of residents of residential care facilities.
2. Articles that reported multifaceted interventions aimed at fall prevention:
  - a.) Where the interventions involved multiple changes to staff practice, or
  - b.) Where the interventions involved multiple changes to staff practice as well as changes to the daily lives of residents.
3. Articles that reported interventions aimed at preventing injuries among residents of residential care facilities.

## Findings

### 1) Single intervention studies aimed at fall prevention

1a.) Interventions aimed at fall prevention involving a single change to staff practice at residential care facilities.

- **Medication Review:** Findings from the Cochrane systematic review of interventions for preventing falls in older people in care facilities found that pharmacist-conducted reviews of medication significantly reduce the rate of falls. Two studies were analyzed in the Cochrane Review: one by Zermansky et al. (2006) and the other by Crotty, Rowett, Spurling, Giles, & Phillips (2004).

Zermansky et al.'s study (2006) involved a pharmacist's clinical review of the medications used by residents of nursing homes. The clinical records of each resident in the intervention group were reviewed during a consultation with the resident and his/her family. The pharmacist formulated recommendations about changes in medication, changes in dosage, or changes in timing of medication and passed them on to the resident's GP for consideration and implementation. Control patients received usual care.

During the six months of the study, pharmacists conducted 315 reviews of medication among residents in the intervention group. During the same time period, 60 of the 330 residents in the control group had their medications reviewed independently by their own physician.

The number of changes to residents' medication during the study period was greater in the intervention group than in the control group even though there was no significant difference in the number of medicines being used by both groups. Over the course of the study, the pharmacist recommended nearly as many starts of new medicines as discontinuations among the intervention group.

Findings showed a large and significant reduction in the number of falls ( $p < 0.001$ ) when the fall rate in the intervention group (0.8 falls per resident) was compared to that of the control group (1.3 falls per resident). This suggests that the intervention may have prevented 160 falls in the intervention group over six months—a clinically important outcome.

Study authors suggested that stopping medications that can cause confusion, sedation or hypotension, and adjusting or starting medication that improves mobility (such as anti-Parkinson's medication) might reduce falls.



Crotty et al.'s study (2004) noted that when older people move from hospital to residential care facilities they are vulnerable to fragmented care and adverse effects. Crotty found that the simple intervention of reviewing medication resulted in reduction in pain, hospital usage, emergency department visits, and falls, as well as positive changes in mobility, behavior, and confusion.

- **Fall Diaries:** A randomized controlled study conducted by Bouwen, De Lepeleire, & Buntinx (2008) investigated the effect of the use of diaries kept by nursing staff on the rate of falls as an intervention. The study was conducted in seven residential care facilities over a period of six months. There was no significant difference between the two groups of residents in the study with regard to mobility and cognition.

Nursing staff at the intervention facilities were trained in falls risk identification and in environmental or behavioural modifications to avoid falls. The intervention consisted of asking nursing staff to record in diaries information about falls they had observed or heard about, including reasons why the fall had occurred and what could be done to prevent a similar fall from occurring in the future.

At the end of the study period analysis revealed a substantial reduction in the number of residents who had fallen in the facilities where the nurses had kept fall diaries: 14% of residents in the intervention group had fallen at least once compared to 24% of residents in the control group (no p-value was provided in the findings).

Findings from the diaries provided insight as to when and how falls had occurred; most occurred in the evening around 6 pm each day – a time when staff presence was low. About 50% occurred in residents' rooms, and the majority occurred when residents were rising from a sitting position, or standing or walking without assistance. The most often cited causes of falls were losing balance or stumbling.

- **Post-fall Assessment:** A randomized controlled trial conducted by Rubenstein, Robbins, Josephson, Schulman, & Osterweil (1990) examined post-fall assessments of residents. Findings showed that once health problems that contributed to the fall were identified and addressed, the rate of falls in the intervention group was significantly reduced. The authors concluded that falls could be an indicator of serious and unrecognized underlying illness and disabilities.

The intervention used in this study (post-fall assessments) was comprised of detailed physical examinations and environmental assessments by a nurse practitioner, including: laboratory tests, electrocardiogram, and 24-hour Holter (heart) monitoring. Through review of post-fall assessments, many remediable problems (e.g., weakness, environmental hazards, low blood pressure, drug side effects, gait dysfunction) were detected. At the end of the 2-year follow-up period, the intervention group had 26%

fewer hospitalizations ( $p < 0.05$ ) and a 52% reduction in hospital days ( $p < 0.01$ ) compared with controls.

- **Increased Supervision:** A 2009 study carried out by Shimada, Tiedemann, Lord, & Suzuki focused on the frailest and most cognitively impaired or physically disabled residents in a long-term care facility. The intervention involved recruiting two fall prevention aides, with each aide working one day per week from 9 am to 5 pm over 25 weeks. The aide's job was to spend time with residents identified as being at high risk of falling, including checking on them every hour. The number of falls on the intervention days was compared to the number of falls on pre-selected non-intervention days during the hours when the aide was present. Findings showed a significant difference in the number of falls occurring on intervention days when compared to those that occurred on non-intervention days (12 falls versus 20;  $p = 0.046$ ) and in the number of fallers between the intervention days and non-intervention days (9 fallers versus 17;  $p = 0.0012$ ). Results indicate the effectiveness of providing extra supervision in preventing falling among the frailest residents of the care facility.
- **Volunteer Companions:** A study by Donoghue, Graham, Mitten-Lewis, Murphy, & Gibbs (2005) reported the effectiveness of a volunteer companion program on the rate of falls in an aged care ward. Patients admitted to the aged care ward were assessed by nurses for fall risk and those identified as having the highest fall risk were placed in a room near the nurses' station. Volunteer companions were present in this room throughout the day. Their function was to observe patients for increasing agitation or risky behaviour and to then gently attempt to calm and reassure them with the option of alerting a nurse if necessary. Other activities conducted by volunteers included conversation, playing cards, reading out loud, playing music, and providing practical assistance at meal times and with finding belongings at the bedside (reading glasses, tissues). Over the first 19 months of this program, a 51% decrease in falls was noted in the aged care ward and no falls occurred when volunteer companions were present.

*1 b.) Interventions aimed at fall prevention where the intervention involved a single change to the lives of residents of residential facilities.*

- **Vitamins and Supplements:** The following is a summary of the Cochrane Review analysis of four randomized controlled studies on dietary supplementation with Vitamin D. The authors concluded that the use of vitamin D significantly reduced the rate of falls among elderly people living in residential care facilities.

Bischoff et al. (2003) used a randomized double-blind trial to compare the effects of calcium plus 400 IU of vitamin D and calcium supplementation alone on the number of falls over a 12-week period.

Results showed that of 80 falls that had occurred during the treatment period, 25 (14 persons) were in the calcium plus vitamin D group and 55 (18 persons) were in the calcium group. Supplementation with calcium plus vitamin D resulted in a significant decrease in falls ( $p < 0.01$ ) in the intervention group.

Final analysis showed calcium plus vitamin D treatment accounted for a 49% reduction in falls per person; recurrent fallers seemed to benefit most from the calcium plus vitamin D supplementation; and supplementation with calcium plus vitamin D were superior to calcium supplementation alone with regard to musculoskeletal function and bone metabolism.

Broe et al. (2007) sought to discover the daily dose of vitamin D that would result in the greatest decrease in falls in residential care settings. This study was a 5-month, double-blind, placebo-controlled trial that compared the effect of four vitamin D doses (200 IU, 400 IU, 600 IU, and 800 IU) and a placebo on the rate of falls among residents living in a large long-term care facility.

Over the study period, 61 of 124 (59%) participants had at least one fall. Of these, 11 of 25 (44%) experienced a fall in the placebo group, 15 of 26 (58%) experienced a fall in the 200 IU group, 15 of 25 (60%) experienced a fall in the 400 IU group, 15 of 25 (60%) experienced a fall in the 600 IU group, and five of 23 (20%) experienced a fall in the 800 IU group. Findings showed that participants in the group taking 800 IU vitamin D had a 72% lower rate of falls than the placebo group.

Two other studies included in the Cochrane Review (Flicker et al., 2005; Law, Withers, Morris, & Anderson, 2006) examined the effect of a supplementation of 1000 IU of vitamin D on fall reduction. Although the studies were similar in design, Flicker found a significant reduction in falls resulting from the intervention while Law found no statistical difference.

- **Exercise:** Since muscle weakness and impaired balance have been found to be associated with increased rates of falls among older people (Bruyere et al., 2005) many researchers have investigated whether exercise can reduce fall rates. After analysing findings about different types of supervised exercise programs, including tai chi and gait, balance, strength and resistance training, the Cochrane Review found that results of studies that examined the effect of exercise programs on the rate of falls were inconsistent.

One study (Sakamoto et al., 2006) examined in the Cochrane Review found a significant reduction in falls following a simple exercise program. Sakamoto's intervention group completed an exercise program each day that involved standing on one foot for one minute (with support if necessary) and then standing on the other foot for one minute,

repeated three times, three times each day. Findings from the study revealed a significant decrease in the rate of falls ( $p < 0.01$ ) among members of the intervention group compared to that among members of the control group.

- **Wearing Shoes:** A review of fall reporting forms prepared over a 6-month period in 14 residential care facilities by Kerse, Butler, Robinson, & Todd (2004b) found that wearing slippers, compared to shoes, was associated with increased likelihood of falling. Kerse noted that the study was unique in identifying the influence of shoe type on falls and suggested that shoes should be worn by residents at all times.

**Table 1: Levels of Evidence for Studies Involving a Single Intervention**

Author	Date	Source	Description	Evidence Level <sup>1</sup>
Bischoff, et al	2003	Effects of vitamin D and calcium supplementation on falls: A randomized controlled trial. <i>Journal of Bone and Mineral Research</i> : 18(2), 343-351.	Randomized double-blind controlled trial. Compared calcium plus 400 IU of vitamin D to calcium supplementation alone on the number of falls.	II  Evaluated in Cochrane Review
Bouwen, et al	2008	Rate of accidental falls in institutionalised older people with and without cognitive impairment halved as a result of a staff-oriented intervention. <i>Age and Ageing</i> , 37(3), 306-310.	Randomized controlled trial investigated effect of the use of diaries kept by nursing staff on the rate of falls in seven residential care facilities over a period of six months.	II
Broe, et al	2007	A higher dose of vitamin D reduces the risk of falls in nursing home residents: A randomized, multiple-dose study. <i>Journal of the American Geriatrics Society</i> , 55(2), 234-239.	Double blind, placebo-controlled randomized trial. Compared the effect of four vitamin D doses (200 IU, 400 IU, 600 IU, and 800 IU) and a placebo on the rate of falls among residents living in a large long-term care facility.	II  Evaluated in Cochrane Review

<sup>1</sup> Level I: Evidence obtained from a systematic review of all the relevant randomized controlled trials.  
 Level II: Evidence obtained from at least one properly designed randomized controlled trial.  
 Level III: Evidence obtained from comparative studies.  
 Level IV: Evidence obtained from case studies.

Taken from the Australian Government National Health and Medical Research Council, hierarchy of research evidence, June 2009. Retrieved April 30, 2010 from:  
[http://www.nhmrc.gov.au/files\\_nhmrc/file/guidelines/Stage%20%20Consultation%20Levels%20and%20Grades.pdf](http://www.nhmrc.gov.au/files_nhmrc/file/guidelines/Stage%20%20Consultation%20Levels%20and%20Grades.pdf)

Crotty, et al	2004	Does the addition of a pharmacist transition coordinator improve evidence-based medication management and health outcomes in older adults moving from the hospital to a long-term care facility? Results of a randomized controlled trial. <i>The American Journal of Geriatric Pharmacotherapy</i> , 2(4), 257-264.	Randomized controlled trial involving review of medication of hospitalized older adults awaiting transfer to long-term residential care facilities	II  Evaluated in Cochrane Review
Donoghue, et al	2005	A volunteer companion-observer intervention reduces falls on an acute aged care ward. <i>International Journal of Health Care Quality Assurance</i> , 18(1), 24-31.	Effect of a volunteer companion program on the rate of falls in an aged care ward. Compared rate of falls on ward during intervention period with rate before volunteer companions were present.	III
Flicker, et al	2005	Should older people in residential care receive vitamin D to prevent falls? Results of a randomized trial. <i>Journal of the American Geriatrics Society</i> , 53(11), 1881-1888.	Randomized placebo-controlled trial. Intervention involved supplementation with 1,000IU of Vitamin D or placebo for two years.	II  Evaluated in Cochrane Review
Kannus, et al	2000	Prevention of hip fracture in elderly people with use of a hip protector. <i>The New England Journal of Medicine</i> , 343(21), 1506-1513.	Randomized controlled trial of the use of hip protectors by frail elderly people.	II
Kerse, et al	2004	Wearing slippers, falls and injury in residential care. <i>Australian and New Zealand Journal of Public Health</i> , 28(2), 180-187.	Statistical analysis of data on falls in nursing homes revealed that wearing shoes rather than slippers was one factor associated with fewer injurious falls.	III

Law, et al	2006	Vitamin D supplementation and the prevention of fractures and falls: Results of a randomised trial in elderly people in residential accommodation. <i>Age and Ageing</i> , 35(5), 482-486.	Randomized controlled trial examined the effect of a supplementation of 1000 IU of vitamin D on fall reduction.	II  Evaluated in Cochrane Review
Parker, et al	2005	Hip protectors for preventing hip fractures in older people. <i>Cochrane Database Systematic Reviews</i> , 20(3): CD001255.	Cochrane Review of research conducted in nursing or residential care settings on the use of hip protectors.	I
Rubenstein, et al	1990	The value of assessing falls in an elderly population. A randomized clinical trial. <i>Annals of Internal Medicine</i> , 113(4), 308-316.	Randomized controlled trial examined post-fall assessments of residents.	II  Evaluated in Cochrane Review
Sakamoto, et al	2006	Effects of unipedal standing balance exercise on the prevention of falls and hip fracture among clinically defined high-risk elderly individuals: A randomized controlled trial. <i>Journal of Orthopaedic Science: Official Journal of the Japanese Orthopaedic Association</i> , 11(5), 467-472.	Randomized controlled trial. Intervention involved a simple exercise program – standing on one foot for one minute (with support if necessary) and then standing on the other foot for one minute, repeated three times, three times each day.	II  Evaluated in Cochrane Review
Shimada, et al	2009	The effect of enhanced supervision on fall rates in residential aged care. <i>American Journal of Physical Medicine &amp; Rehabilitation</i> , 88(10), 823-828.	Randomized controlled trial. Intervention involved recruiting two fall prevention aides. Each aide worked one day per week. The aide’s job was to spend time with residents identified as being at high risk of falling, including checking on them every hour.	II

Simpson, et al	2004	Does the type of flooring affect the risk of hip fracture? <i>Age &amp; Ageing</i> , 33(3), 242-245.	Data gathered on the number and location of falls at 34 residential care homes for older people were recorded as well as material of sub-floor and type of covering on floor on which fall occurred. Data gathered for two years.	III
Zermansky, et al	2006	Clinical medication review by a pharmacist of elderly people living in care homes--randomised controlled trial. <i>Age &amp; Ageing</i> , 35(6), 586-591.	Randomized controlled trial. Intervention involved a pharmacist's clinical review of the medications used by residents of nursing homes. The pharmacist formulated recommendations about changes in medication, changes in dosage, or changes in timing of medication. Six-month study.	II  Evaluated in Cochrane Review

2) Multifaceted intervention studies aimed at fall prevention

2 a.) Multifaceted interventions aimed at fall prevention where the interventions involved a number of changes in staff practice at residential care facilities.

The majority of falls in residential care facilities are caused by a complex combination of factors including mobility issues, impaired cognition, unsafe behaviors, and environmental hazards (Ray et al., 1997). Multifaceted interventions seek to address a number of individual issues that might contribute to falls at the same time.

The Cochrane Review included nine multifaceted studies. Four of these studies (Kerse, Butler, Robinson, & Todd, 2004a; Kerse et al., 2008; Ray et al., 1997; Shaw et al., 2003) examined the efficacy of multifaceted interventions involving changes in staff practices including: risk assessment, staff training, identification of high risk fallers, physiotherapy, occupational therapy, creating a fall prevention coordinator, removing hazards, and post-fall conferences. The other five studies (Becker et al., 2003; Dyer et al., 2004; Jensen, Lundin-Olsson, Nyberg, & Gustafson, 2002; Kerse et al., 2008; McMurdo, Millar, & Daly, 2000; Ray et al., 1997) examined the efficacy of multifaceted interventions that involved

both change in staff practice as well as changes in the lives of residents. These studies utilized combinations of interventions listed above together with some or all of the following: vitamin D supplementation, exercise, optometry, podiatry, medication review, goal setting, resident fall prevention training, inspection and repair of assistive equipment, and the use of hip protectors. When considering all studies combined, the Cochrane analysis of results of these nine trials found that “in nursing care facilities, interventions targeting multiple risk factors were not clearly effective in preventing falls but may be so when these interventions are provided by a co-ordinated team of health workers” (Cameron et al., 2010)

- Modifying environments that might lead to falls: Ray et al.’s (1997) study, analysed in the Cochrane review, found a significant reduction in falls resulting from changes in staff practice. Using a randomized controlled trial, findings showed statistically significant reduction in the rate of falls in the intervention facilities when compared to the control facilities: intervention facilities had 19% fewer recurrent fallers and 31% fewer injurious falls than did control facilities ( $p=0.03$ ). Ray applied a comprehensive multifaceted approach aimed at addressing the complex causes of falls in residential care facilities. The cornerstone of the intervention program was a multidisciplinary team and structured assessment for each resident that encompassed the following four safety domains:

1.) **Environmental and Personal Safety:** Identifying potential falls hazards in such areas as beds, floor surfaces, clutter, lighting, accessibility of objects, bathroom equipment, foot care, and unsafe footwear. Safety recommendations included installing wheel locks for beds, changing lighting, modifying flooring, repositioning or repairing call lights, purchasing bathroom equipment such as raised toilet seats, and using properly fitting shoes.

2.) **Assistive Equipment:** Team occupational therapists conducted a detailed assessment for every study resident who used a wheelchair. The assessment evaluated maintenance, safety features, foot and leg rests, the seat and back, forward motion protection, resident posture, and propelling/reaching. The team corrected wheelchair problems as soon as possible and instituted a wheelchair maintenance program in each facility.

3.) **Medication:** The team reviewed the appropriateness of psychotropic drug use among regular users. A geropsychiatrist conducted a structured diagnostic assessment to identify treatment alternatives that posed less fall risk and when appropriate wrote letters to the attending physicians suggesting drug regimen changes. The psychiatrist also suggested appropriate psychosocial interventions and occasionally recommended that residents with severe problems receive further psychiatric evaluation.



4.) **Transferring and Ambulation:** A team occupational therapist observed all study residents transferring from bed, chair (wheel/lounge), and toilet; safety was assessed in terms of equipment height and stability, transfer process, and quality of staff assistance. Findings were used to instruct staff in safer transferring techniques, to suggest routine staff assistance, to repair or modify canes and walkers, to obtain a physical therapist consultation, or to recommend a medical consultation. For residents with dementia-related unsafe transferring, an occupational therapist interviewed staff and if possible observed the unsafe behaviour. Following this, the team instructed staff in techniques for communicating with and caring for cognitively impaired residents and suggested specific interventions such as scheduled attention to needs or position alarms.

Following assessments, the team reviewed the data for each study resident and developed a structured, individual treatment plan. Each nursing home appointed a fall prevention coordinator, who was responsible for coordinating implementation of these treatment plans. In addition, a team nurse provided three 45-minute in-service training sessions for all patient care staff. Training provided a general discussion of the causes and consequences of falls as well as practical safety suggestions for each of the four study safety domains: a quick environment check, a quick wheelchair check, a checklist for adverse effects of psychotropic drugs, and a quick transfer check. The last training session focused on review and refinement of the resident treatment plans.

- Multifaceted intervention in psycho-geriatric care: Neyens et al. (2009) investigated the following changes in staff practice in twelve psycho-geriatric care facilities:
  - 1.) The creation of a multidisciplinary fall prevention team on each psycho-geriatric care ward consisting of regular care staff: a physician, two nurses, a physiotherapist and an occupational therapist. Each team met every two weeks to discuss residents on admission, after a fall, at the request of health care professionals on the ward, and at least two times each year even if there had been no fall incident or request.
  - 2.) The completion of a general medical assessment when a resident was admitted or when there was a change in medical condition. This assessment included a fall risk evaluation.
  - 3.) Creation of an individual fall prevention plan for each resident including any or all of the following: anticipating the circumstances and causes of falls, critically reviewing and monitoring medication intake (type, number, dose and time of intake), individually designed exercise programmes, assessing the need for assistive and protective aids, and promoting their safe use.

Analysis of fall data after twelve months showed a statistically significant reduction in falls: 2.09 falls per resident in the intervention group each year, as compared to 2.54

falls per resident (no p-value provided) in the control group per year. Further analysis, which took account of the duration of inclusion in the intervention programme, showed that the longer the program operated, the lower the fall risk.

Findings from this study show that fall prevention targeted at psycho-geriatric patients in residential care settings is both possible and effective in reducing falls among those at the highest risk. However, Neyens concluded that it is not easy and requires a lot of effort on the part of staff.

*2 b.) Multifaceted interventions aimed at fall prevention where the interventions involved both changes in staff practice as well as changes to the daily life of residents of residential care facilities.*

- Comprehensive program of interventions: Jensen, Lundin-Olsson, Nyberg, & Gustafson (2002) examined the effect of a randomized controlled trial of comprehensive interventions on fall reduction at nine residential care facilities. Her study, conducted in nine facilities, involved staff education; environmental inspection and modification (including rearranging furniture, quickly wiping up wet floors, removing loose carpets, repairs to doorsteps, provision of grip bars, new beds, and improved lighting); resident-specific exercise to improve balance, strength and gait; inspection and repairs to aids; supply of properly fitting footwear; review and changes of medication; vision and hearing examination; use of hip protectors; and post-fall conferencing.

Results showed a statistically significant reduction in falls between the intervention and the control group. Time to first fall was longer for the intervention group, fewer members of the intervention group sustained more than one fall, fewer members of the intervention group sustained hip fractures as a result of falls, and no one in the intervention group wearing hip protectors sustained a hip fracture. A similar study conducted by Becker (Becker et al., 2003) had comparable findings.

- Commitment to fall prevention: A recent large-scale study (Rapp et al., 2010) sought evidence to support the hypothesis that fall prevention programs reduce the incidence of hip fractures among nursing home residents. Rapp examined data on hip fractures from more than 50,000 residents in 1,000 nursing homes over a two-year period. Analysis of data showed no significant difference in the incidence of hip fractures between the nursing homes where fall prevention programs were in place and nursing homes where no fall prevention programs were in place. While these findings might indicate that fall prevention programs are ineffective, further investigation suggested that the most likely reason that the rate of hip fractures was not reduced was inadequate uptake of programs, inadequate adherence to programs or both. Rapp reports that in the intervention facilities, hip protectors were available to only 9% of residents, only 12% of residents took part in exercise programs, and the reduction of

psychotropic medication and the administration of Vitamin D may not have been sufficient. Rapp’s study highlights the need for commitment on the part of administrators and staff at long-term care facilities to reducing the incidence of falls and the incidence of fractures through implementation and adherence to fall prevention programs.

**Table 2: Levels of Evidence for Studies Involving Multifaceted Interventions**

Author	Date	Source	Description	Evidence Level <sup>2</sup>
Becker, et al	2003	Effectiveness of a multifaceted intervention on falls in nursing home residents. <i>Journal of the American Geriatrics Society</i> , 51(3), 306-313.	Randomized control trial. Intervention involved staff training, resident education, exercise, environmental adaptations, and use of hip protectors.	II  Evaluated in Cochrane Review
Dyer, et al	2004	Falls prevention in residential care homes: A randomized controlled trial. <i>Age and Ageing</i> , 33(6), 596-602.	Multifaceted randomized controlled trial. Interventions included: gait and balance training, medication review, podiatry and optometry.	II  Evaluated in Cochrane Review
Jensen, et al	2002	Fall and injury prevention in older people living in residential care facilities. A cluster randomized trial. <i>Annals of Internal Medicine</i> , 136(10), 733-741.	Randomized controlled trial. Intervention involved staff training, environmental modifications, exercise, supply or repair of aids, change in medication, use of hip protectors, and post-fall conferencing.	II  Evaluated in Cochrane Review

<sup>2</sup> Level I: Evidence obtained from a systematic review of all the relevant randomized controlled trials.  
 Level II: Evidence obtained from at least one properly designed randomized controlled trial.  
 Level III: Evidence obtained from comparative studies.  
 Level IV: Evidence obtained from case studies.

Taken from the Australian Government National Health and Medical Research Council hierarchy of research evidence, June 2009. Retrieved April 30, 2010 from:  
[http://www.nhmrc.gov.au/files\\_nhmrc/file/guidelines/Stage%20%20Consultation%20Levels%20and%20Grades.pdf](http://www.nhmrc.gov.au/files_nhmrc/file/guidelines/Stage%20%20Consultation%20Levels%20and%20Grades.pdf)

Kerse, et al	2004	Fall prevention in residential care: A cluster, randomized, controlled trial. <i>Journal of the American Geriatrics Society</i> , 52(4), 524-531.	Randomized, controlled trial. Intervention included appointment of falls coordinator to undertake fall-risk assessment of all residents, develop care plans, coordinate with other healthcare professionals, and ensure recommendations followed and use of logos to identify residents at high risk of falling.	II  Evaluated in Cochrane Review
Kerse, et al	2008	Does a functional activity programme improve function, quality of life, and falls for residents in long term care? Cluster randomized controlled trial. <i>BMJ: British Medical Journal</i> , 337(7675), 912-915.	Randomized controlled trial. Intervention involved a functional assessment of each participant, goal setting, and an individualized programme of physical activity and exercises to achieve resident's goal.	II  Evaluated in Cochrane Review
McMurdo, et al	2000	A randomized controlled trial of fall prevention strategies in old peoples' homes. <i>Gerontology</i> , 46(2), 83-87.	Randomized controlled trial. Intervention involved falls risk factor assessment and seated balance exercise training program.	II  Evaluated in Cochrane Review
Neyens, et al	2009	A multifactorial intervention for the prevention of falls in psychogeriatric nursing home patients, a randomised controlled trial (RCT). <i>Age &amp; Ageing</i> , 38(2), 194-199.	Randomized controlled trial. Intervention involved a general medical assessment; a specific falls-risk evaluation assessing fall history, medication, mobility and the use of assistive and protective aids; and creation of fall prevention activities and/or individually tailored fall prevention interventions for each patient. Program coordinated by a multidisciplinary fall prevention team.	II

Rapp, et al	2010	Effect of a statewide fall prevention program on incidence of femoral fractures in residents of long-term care facilities. <i>Journal of the American Geriatrics Society</i> , 58(1), 70-75.	Analysis of data on incidence of hip fractures gathered from nursing homes where fall prevention programs were in place and from nursing homes where no fall prevention programs were in place.	II
Ray, et al	1997	A randomized trial of a consultation service to reduce falls in nursing homes. <i>JAMA: The Journal of the American Medical Association</i> , 278(7), 557-562.	Randomized controlled trial. Comprehensive intervention included: staff training, environmental and personal safety assessment, assistive equipment inspection, medication review, transferring and ambulation review, falls risk assessments and creation of structured, individual treatment plan.	II  Evaluated in Cochrane Review
Shaw, et al	2003	Multifactorial intervention after a fall in older people with cognitive impairment and dementia presenting to the accident and emergency department: Randomised controlled trial. <i>BMJ (Clinical Research Ed.)</i> , 326(7380), 73-73.	Randomized controlled trial involving older people (aged 65 or over) with cognitive impairment and dementia who had visited emergency departments. The patients underwent multifactorial clinical assessment (medical, physiotherapy, occupational therapy, and cardio-vascular) at baseline. Those randomized to the intervention group received interventions for all identified falls risk factors. Data on falls, injuries, attendance at emergency dept, hospital admission, and mortality collected for 1 year.	II  Evaluated in Cochrane Review

*3) Interventions aimed at preventing fall-related injuries among residents of residential care facilities*

- **Use of Hip Protectors:** Kannus et al. (2000) conducted a randomized controlled trial of the use of hip protectors by frail elderly people. The study involved over 1800 people randomly assigned either to a group that wore hip protectors or to one that did not. Findings showed that the rate of hip fractures were statistically significantly reduced through the use of hip protectors ( $p = 0.008$ ), and that the rate of pelvic fractures due to a fall were slightly reduced.

The 2005 Cochrane review of hip protector use (Parker, Gillespie & Gillespie, 2005) found a wide range of results from 11 different trials conducted in nursing or residential care settings. When the results were pooled, data showed evidence of a marginally statistically significant reduction in hip fracture incidence (relative risk (RR) 0.77, 95% confidence interval (CI) 0.62 to 0.97). However, these results are influenced by the 'intention to treat' methodology, whereby hip fractures that occurred among intervention group subjects (those assigned to wear hip protectors) were counted even if they were not wearing hip protectors at the time of the fall.

- **Selection of sub-floor materials and covering:** Simpson, Lamb, Roberts, Gardner, & Evans (2004) investigated whether the type of floor covering or the type of material used in the sub-floor of residential care facilities had an effect on the incidence of falls and hip fractures due to falls.

The types of floors investigated were: wooden sub-floor with no carpet; wooden sub-floor with carpet; concrete sub-floor with no carpet; and concrete sub-floor with carpet. A total of 6,641 falls were recorded during the 2 years of the study.

Simpson found that although more falls occurred on carpeted than uncarpeted floors, there was also relatively more time that residents spent walking and standing in carpeted corridors, lounges and dining rooms than in uncarpeted bathrooms and other utility rooms. There were 222 hip fractures associated with the 6,641 falls. Carpeted floors with wooden sub-floors were associated with the lowest number of fractures per 100 falls. When comparing wooden floors to concrete floors, regardless of carpeting, there was a statistically significant difference with 2.5 hip fractures per 100 falls for wooden floors compared to 4.1 per 100 falls for concrete floors.

**Table 3: Levels of Evidence for Studies Involving Preventing Fall-related Injuries**

Author	Date	Source	Description	Evidence Level <sup>3</sup>
Kannus, et al	2000	Prevention of hip fracture in elderly people with use of a hip protector. <i>The New England Journal of Medicine</i> , 343(21), 1506-1513.	A randomized controlled trial of the use of hip protectors among over 1800 by frail elderly people. Hip fractures were statistically significantly reduced through the use of hip protectors (p = 0.008), and that the rate of pelvic fractures due to a fall were slightly reduced.	II
Parker, et al	2005	Hip protectors for preventing hip fractures in older people. <i>Cochrane Database Systematic Reviews</i> , 20(3), CD001255.	A Cochrane review of hip protector use found a wide range of results from 11 trials in nursing or residential care. Pooled data showed marginally statistically significant reduction in hip fracture. Results were influenced by the 'intention to treat' methodology, whereby fractures among those assigned to wear hip protectors were counted even if they were not wearing hip protectors at the time of the fall.	I
Simpson, et al	2004	Does the type of flooring affect the risk of hip fracture? <i>Age &amp; Ageing</i> , 33(3), 242-245.	Prospective two-year observational study of falls and fall-related hip fractures in residential care facilities. Compared 3 flooring types (carpet, wood and concrete). Significantly more hip fractures occurred on concrete floors compared to wooden floors. Carpeted floors with wooden subfloors were associated with the fewest hip fractures.	III

<sup>3</sup> Level I: Evidence obtained from a systematic review of all the relevant randomized controlled trials.

Level II: Evidence obtained from at least one properly designed randomized controlled trial.

Level III: Evidence obtained from comparative studies.

Level IV: Evidence obtained from case studies.

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## Conclusions

The findings from the studies reviewed here present a wide range of effective interventions for the prevention of falls and related injuries. These range from single interventions by staff members and individual changes that residents can make, to multifactorial interventions that are best implemented by a multidisciplinary team with the involvement of residents and family members. The challenge is how to translate this evidence into effective and sustainable change in practice. To facilitate this, please see the ***Residential Care Fall and Fall-Related Injury Prevention Toolkit*** that includes an inventory of credible fall prevention guidelines, programs and assessment tools. It should be noted that new evidence is continually being generated in the field of fall and fall-related injury prevention. We encourage clinicians to stay connected through credible websites on the latest evidence such as:

- Centre of Excellence for Mobility, Fall Prevention and Injury in Aging (CEMFIA) site at: <http://www.hiphealth.ca/CEMFIA.htm>;
- BC Injury Research and Prevention Unit (BCIRPU) at: <http://www.injuryresearch.bc.ca>;
- Canadian Best Practices Portal, Public Health Agency of Canada at: <http://cbpp-pcpe.phac-aspc.gc.ca/>;
- Registered Nurses Association of Ontario at: <http://www.rnao.org/Page.asp?PageID=924&ContentID=810>
- California Fall Prevention Centre of Excellence at <http://www.stopfalls.org/>
- Prevention of Falls Network Europe (ProFaNE) at: <http://www.profane.eu.org/>;
- USA Centres for Disease Control and Prevention at: <http://www.cdc.gov/homeandrecreationalsafety/falls/index.html>;
- Aged Care in Victoria, Australia at: <http://www.health.vic.gov.au/agedcare/maintaining/falls/index.htm>
- Safety Lit Injury Abstracts on line at: <http://www.safetylit.org>



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## Chapter 4: Translating the Knowledge

Knowledge translation is “a dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the healthcare system” (Straus, Tetroe, & Graham, 2009). To further the goal of knowledge translation for fall prevention in residential care, a special Residential Care Fall Prevention Summit was held on November 5-6, 2009 in Victoria, British Columbia to bring together key stakeholders from practice, research and policy. The two day event focused on synthesizing current knowledge and developing solutions for implementing fall prevention best practices in residential care (RC). The following is a description of the process and outcomes of this Summit.

The Summit opened on both days with presentations from international, national and local experts, including a keynote presentation on research conducted by Dr. Killian Rapp from the Ulm University and Geriatric Rehabilitation Clinic in Stuttgart, Germany. Other speakers covered a wide range of issues, including the use InterRAI MDS data, collaborative approaches to fall prevention; quality improvement for resident safety; implementation of fall prevention best practices and new technologies; mobile fall assessment units; mobility assessment; accreditation standards, and the epidemiology of residential care fall injuries. Many of these presentations can be found on the CEMFIA website at <http://hiphealth.ca/CEMFIA.htm>.

Following the presentations, participants took part in facilitated working groups to develop recommendations for fall prevention objectives, strategies and actions. Participants worked from draft recommendations sorted into themes that were prepared the Summit Advisory Committee. The Advisory Committee was comprised of fall prevention experts, health authority fall prevention leads, clinicians, policy makers, administrators, researchers and other stakeholders involved in fall prevention in residential care across the province (see Appendix 1). The working group themes that were chosen to guide input from summit participants on directions for the future were:

- 1) Data Collection and Risk Assessment in Residential Care,
- 2) Implementing Best Practices/New Technologies for Fall and Injury Prevention,
- 3) Collaborative Approaches to Fall Prevention in Residential Care, and
- 4) Evaluation, Accreditation and Licensing.

In each working group, discussion was documented by two pre-appointed recorders – one who recorded all content and one who captured highlights and worked with the facilitator for clarification. A summary of each groups’ work was presented to the larger group at the Summit and further refined. Following the Summit, the final work group reports were sent to members of the Advisory group, who were also participants in each of the four groups, for further clarification. The following represents the final product of this process presented under each of the four working

group themes. The following is a summary of the participant working group findings presented as goals, rationale, objectives, strategies and actions for each of the four themes.

### 1. Defining the Problem

**Goal:** To ensure information is available to determine the scope and nature of the problem.

**Rationale:** *Currently there is a poor understanding of the number and rate of falls and resulting injuries across facilities. Most incident reports only require information of the most serious injuries, i.e.: “A fall of such seriousness experienced by a person in care, as to require emergency care by a physician or transfer to a hospital.” Comprehensive information on all falls is important for short and long- term planning.*

Objectives	Strategies	Actions
<p>Ensure that a standardized method to collect facility-wide data on all falls is in place – whether or not the fall results in injury. Use existing data collection tools such as the Patient Safety Learning System (PSLS) and InteRAI Minimum Data Set (MDS) to understand the number and rate of falls, fall injuries and fallers (those who fall once or more). Also monitor hospital separation data for RC from the Discharge Abstract Database (DAD) at a regional level.</p>	<p>1. Use the Patient Safety Learning System (PSLS) for understanding facility-wide fall and related injury patterns. For those facilities that have not yet implemented PSLS, the Fall Report in the <b>Residential Care Fall Prevention Toolkit</b> can be used. (Note: the PSLS contains all elements of the Fall Report.)</p>	<p>Develop and implement a practice guideline requiring the use of the PSLS as a surveillance tool and as a post-fall assessment tool and report on the number and rate (per 1,000 bed days) of falls, fall-related injuries and fallers; location of the fall; type of injury, etc.</p> <p>Identify site staff roles and responsibilities, i.e. Manager ensures that fall incident reports are reviewed in a timely fashion and findings made accessible to staff; and Nurse immediately following fall, reviews PSLS report on line (or Fall Report) to develop or revise the individualized care plan based on identified factors association with fall incident.</p> <p>Each facility will designate a staff member responsible for producing summary reports of facility-wide PSLS or Fall Report (See Toolkit) data on falls, fall-related injuries and fallers on a regular basis to enable long term planning and evaluation.</p>

Objectives	Strategies	Actions
	<ol style="list-style-type: none"> <li>Use the MDS data to determine the ongoing number and rate of fallers in the facility over time (i.e. the number and rate of fallers and whether or not they fell in the last 30 days and / or in the last 31 to 180 days).</li> </ol>	<p>Each facility will designate a staff member responsible for producing summary reports of facility-wide MDS data on fallers on a regular basis to enable long term planning and evaluation.</p>

## 2. Risk Assessment in Residential Care

**Goal:** To ensure assessment activities provide useful information that enables staff to develop individual care plans that result in reduced fall and fall-related injuries.

**Rationale:** *Best practice evidence shows that prevention is best linked to individual risk profiles. Given the changing nature of risk among frail older adults, individual client assessments should occur prior to admission, be updated at admission, on a routine basis, at times of major change in health condition and in response to fall/injury incidents. These practices are consistent with the RC Regulations and Accreditation ROPs that require that fall risk assessment be conducted.*

*There are many validated tools for obtaining fall risk factor information including those provided in the Residential Care Fall Prevention Toolkit, the InterRAI MDS Version 2.0 records and the Patient Safety Learning System. The MDS data provide data on prior falls over the past 180 days and can be linked to other health problems for a comprehensive approach to prevention. MDS data limitations include that it is not implemented immediately upon admission, it is only administered every 6 months after admission, it only records if there was one or more falls in the past 30 or 31 to 180, days, and it does not record the circumstances that contributed to prior falls or the number of falls unless linked to data on other health problems captured by the MDS. The PSLs provides an immediate and comprehensive picture of the fall and can be used for individual care planning along with validated Fall Risk Assessment Tools (FRATs) for identifying risk.*

Objectives	Strategies	Actions
<p>Ensure that all RC clients, and those awaiting RC placement, are assessed in a timely manner for their fall risk using the most appropriate tools, and gathering the pertinent information.</p>	<ol style="list-style-type: none"> <li>For seniors awaiting RC placement, Identify appropriate assessment tool for individual fall history and current fall and fall injury risk status and make available to the admitting facility.</li> </ol>	<p>Prior to RC admission a fall risk assessment is completed, including: a record of fall risk, history of falls and circumstance (total number over prior 180 days, and those resulting in fractured bone(s) over prior 180 day), and mobility, balance and transfer assessment (using validated standardized tool). Potential sources of information include the MDS, PSLs, Fall Report, OT/PT RN and medical reports and resident history.</p>

Objectives	Strategies	Actions
	<p>2. For new residents, ensure that the resident and/or family/caregivers are asked about the fall history and contributing factors and use this information to tailor a fall prevention plan to identified risks.</p> <p>3. For existing residents in RC who have triggered an MDS <i>Clinical Assessment Protocols (CAPs)</i> for falls, i.e., those triggered as being at ‘high’ or ‘medium’ risk for falls, this information must be transferred into the tailored fall prevention plan that addresses the resident’s individual risk factors (Note: CAPs now replace the existing <i>Resident Assessment Protocols (RAPs)</i> in residential care.</p> <p>4. In addition to when a fall CAP is triggered through the MDS, use other information from MDS assessment related to fall risk, to assist in care planning.</p>	<p>Within 24 hours after admission, implement a standardized risk assessment questionnaire to be administered to all residents or their family member/caregiver to determine the nature of their risk so that prevention plans may be tailored to individual’s risk profile (see in Toolkit: <i>Scott Fall Risk Screening Tool</i>; and <i>Morse Fall Scale</i>).</p> <p>Develop practice guideline outlining how a CAP trigger for high and medium risk client is translated into the individual’s Fall Prevention Plan. A Plan must be created if client fell prior to moving in or if they have any identified risk factors for falling. A Plan includes: fall risk, i.e. level, fall frequency and severity, identified risk factors, and interventions tailored to the individual. Care Plan to be updated routinely as new information becomes available from medical assessments, MDS, CAPs, PSLs and other post fall assessments.</p> <p>Implement the InterRAI MDS Version 2.0 assessment as mandated and administer this as soon as possible after a new resident is admitted (protocol now requires this be done within the first 14 days after admission). Even if the resident does not trigger a CAP for falls, use the other information for other CAPs triggered that relate to fall risk in the fall prevention care plan (e.g. trigger for mobility, incontinence, vision, which all relate to fall risk). See Chapter 2 of this document for an overview of fall risks.</p>



Objectives	Strategies	Actions
	<p>5. For post-fall assessments and facility wide planning, use Patient Safety Learning System (PSLS) data.</p> <p>6. Use RC Care Plan Library as a comprehensive evidence-based to tailor prevention strategies to the individual's assessed risk.</p>	<p>Implement the InterRAI MDS Version 2.0 assessment as mandated and administer this as soon as possible after a new resident is admitted (protocol now requires this be done within the first 14 days after admission). Even if the resident does not trigger a CAP for falls, use the other information for other CAPs triggered that relate to fall risk in the fall prevention care plan (e.g. trigger for mobility, incontinence, vision, which all relate to fall risk). See Chapter 2 of this document for an overview of fall risks.</p> <p>Build on existing care planning libraries to better reflect current evidence and clinical relevance for fall and fall-related injury prevention and incorporate this information into individual fall prevention care plans. All clinicians need access to the BC standardized care plan library (see Section D – Collaborative Approaches) developed by the Residential Care Clinical Working Group as soon as it is finalized.</p> <p>Reflect all of the above actions in a practice guideline including: reporting requirements, the timeframe for action; person(s) involved/responsible; and how information is to be used. Field test and implement.</p>

### 3. Implementing Best Practices/New Technologies

**Goal:** To ensure all residential care facilities have implemented multidisciplinary, evidence-based and clinically relevant strategies to reduce falls and fall-related injuries among residents.

**Rationale:** *Emerging best practices and new technologies offer opportunities to significantly reduce falls and associated injuries. However, scientific evidence and new technologies are not always readily translated into practical solutions. Input from all stakeholders is required if new strategies are to be acceptable and sustainable.*

*The Canadian Accreditation Standards and BC Residential Care Regulations require that fall prevention plans and strategies be put in place. To do this based on evidence, and in a way that is relevant to practice, the Summit working groups developed the following strategies and actions.*

Objectives	Strategies	Actions
1. Ensure facility-based leadership capacity exists to build a multidisciplinary approach for fall and fall-related injury assessment, prevention and evaluation activities.	1. Qualified, trained leadership positions are established at each facility with responsibility and designated time for designing, implementing and evaluating a multidisciplinary, multifactorial fall prevention program. Fall prevention leadership training is available through the Canadian Falls Prevention Curriculum (CFPC) available as a two-day workshop or as an E-learning course through the University of Victoria; or through the Registered Nursing Association of Ontario (RNAO) and <i>Safer Health Care Now</i> collaborative (see the RC Toolkit for more information).	<p>Document the roles and responsibilities of a fall prevention site lead, and the roles and responsibilities of all staff for optimal fall prevention programming for residential care facilities. Include a description of supports and resources available and required. Develop job description(s), and a definition of deliverables, goals, success indicators, and QI factors.</p> <p>Establish dedicated time for a fall prevention lead in each care facility to oversee a multidisciplinary approach to fall and fall-related injury assessment, prevention and evaluation activities.</p> <p>Provide continued education and/or resources (e.g., CFPC training and the RNAO Clinical Practice Guidelines). Incorporate and emphasize the fall prevention strategies in all aspects of geriatric care.</p>
2. Ensure each facility has a plan for implementing multidisciplinary and multifactorial best practice strategies.	1. Fall prevention lead will develop and implement in-service fall prevention training for all residential care staff and allied staff (e.g. PT/OT/Social Work).	Access resources for in-service training include materials in the RC Toolkit, such as Fraser Health’s Falls Joint Venture PDSA Planning and Universal Fall Precautions; Vancouver Coastal Health’s S.A.F.E.

Objectives	Strategies	Actions
	2. Provide staff training on least restraint policy and its relation to the prevention of falls and injuries.	Pre-transfer Checklist: Interior Health’s Fall Prevention Interventions and Strategies for Residential Care.
3. Ensure each facility has implemented best practice policies related to least restraints.	1. Regional/provincial Clinical Practice Guidelines are in place for the prevention of falls and related injuries least restraint policies, including recommending that physical and chemical restraints not be used as a fall-prevention strategy.	Develop and implement regional/provincial least restraint policies based on information and tools from the RC Toolkit, including the Northern Health Least Restraint Clinical Practice Guideline; and the RNAO, University of Ottawa, Restraint Prevalence Tools: Nursing Best Practice Guidelines).
4. Ensure each facility has implemented best practice policies related to medication review.	1. Regional/provincial Clinical Practice Guidelines are in place for the prevention of falls and related injuries medication review policies that address the risk versus benefit, i.e., Does the benefit of the drug outweigh a possible risk of falling?; Is there a safer alternative drug? Is it possible to minimize the dose without losing the benefit of the drug?	Develop and implement regional/provincial policies for medication reviews to reduce the risk of falls and related injuries based on information and tools from the Toolkit, including the College of Pharmacists of BC: Residential Care Facilities and Homes Standards of Practice section 14; Drugs and the Risk of Falling; Medications and Falls; and the Interior Health Medication Review.
5. Ensure each facility has implemented best practice policies related to hip protectors and new technologies.	1. Regional/provincial Clinical Practice Guidelines are in place that reflect the prevention of falls and related injuries evidence on new technologies and equipment by staying current with the evidence through being part of knowledge exchange collaboratives, participating in on-line seminars, attending relevant conferences, and reading literature reviews on credible websites, such as the Prevention of Falls Network Europe (ProFaNE at <a href="http://www.profane.eu.org/">http://www.profane.eu.org/</a> ).	Implement policies for remaining current with new technologies and following best practices for equipment that reduce the risk for fall and related injuries based on current evidence. See the RC Toolkit for information from SATEC Resistant Flooring; the Canadian Red Cross’s Guidelines for Wheelchairs and Four Wheeled Walkers; and Fraser Health’s <i>Hip Protectors: Always on Your Side</i> and <i>Interior Health Wanted: A Protected Hip</i> .

Objectives	Strategies	Actions
<p>6. Ensure each facility has implemented best practice policies related to foot wear and physical activity.</p>	<ol style="list-style-type: none"> <li>1. Policies are in place for the examination and replacement of unsafe clothing and footwear.</li> <li>2. Outcome-based physical activity programs are in place to optimize balance, muscle function , strength, and postural strategies and improve reaction time (see in Toolkit: Best Practice in Falls and Injury Prevention: Increasing Strength and Balance for Seniors; and Activity and Aging Community of Practice: Recommended Practice Guidelines – Outcome-focused Physical Activity Programming in Long-term Care Homes).</li> </ol>	<p>Implement policies on clothing and footwear, such as those seen in the RC Toolkit: Interior Health’s Feet/Footwear Review.</p> <p>Review existing tools to ensure an emphasis on: outcome-based activity, that is resident-centred and purposeful; the concept that encouraging mobilization if everyone’s business; physical activity is both part of daily living and can be part of a targeted activity.</p> <p>Articulate the role of the fall prevention lead in facilitating implementation of the appropriate program and monitoring program effectiveness.</p>

## 4. Collaborative Approaches

**Goal:** To ensure all parts of the system are working synergistically to implement evidence-based and best practice strategies throughout the system.

**Rationale:** *There are some specific tasks that only a province-wide collaborative effort can effectively address, such as environmental standards for fall prevention.*

Objectives	Strategies	Actions
1. Strengthen partnering and mentoring capacity across the system.	<ol style="list-style-type: none"> <li>1. Establish a sustainable residential care fall and fall-related injury prevention and least restraint collaborative in each Health Authority with representation for publicly-funded residential care facilities to ensure that current practice is evidence-based and clinically relevant.</li> <li>2. Establish partnering and mentoring strategies within, and across, Health Authorities to support fall prevention planning. See sample strategies in the Toolkit: under the Fraser Health's Joint Venture Enrolment Package.</li> </ol>	<p>Develop terms of reference for the collaborative (i.e. what the purpose is, who is involved, what processes are used, what results are sought).</p> <p>Develop engagement strategy to achieve the broadest and most inclusive representation of residential care facilities in each health authority.</p> <p>Foster linkages between HA collaboratives, BC Fall and Injury Prevention Coalition, the Centre of Excellence on Mobility, and the BC Fall Prevention &amp; Injury in Aging for the purpose of information exchange across the province.</p> <p>Note: One of the jobs of the collaborative is to work on the RC Care Plan Library referred to above.</p>
2. Ensure that policy and practice tools are supported by up-to-date evidence and that best practice are in place	<ol style="list-style-type: none"> <li>1. Regional/provincial Clinical Practice Guidelines are in place for the prevention of falls and related injuries (see in Toolkit examples of Clinical Practice Guidelines).</li> </ol>	<p>Set up steering committee to define breadth, scope, and purpose of clinical practice guidelines aimed at avoiding duplication, increasing efficiency and effectiveness, and ensuring continuity and consistency of practice.</p>

Objectives	Strategies	Actions
	<p>2. Regional/provincial guidelines are in place regarding elder-friendly environments to reduce fall risk hazards.</p>	<p>Implement guidelines with recommendations regarding the building and retrofitting of residential care facilities to become elder friendly by applying proven risk-reduction strategies. Implement a multi-disciplinary process for facility-wide environmental assessments of potential fall risk hazards, with particular attention to locations where residents have fallen (see in RC Toolkit: Code Plus - Physical Design Components for an Elder Friendly Hospital; and Residential Complex Care Building Requirements: Existing Building).</p>
<p>3. Ensure all residential care staff have access to and participate in ongoing education and training in fall and fall-related injury prevention and least restraint practice.</p>	<p>1. Develop a plan to implement education and training on fall and fall-related injury prevention and on least restraint across the staffing continuum.</p>	<p>Implement modules into college-based community care training (e.g., residential care aides, home support workers, etc.)</p> <p>Implement mandatory education for fall prevention leaders/educators in each facility, such as the Canadian Falls Prevention Curriculum or RNAO Collaborative. .</p> <p>Fall prevention leads/educators to implement in-service training using e-learning, webinars, workshops, and/or peer training for all staff working with older adults.</p>

## 5. Evaluation, Accreditation and Licensing

**Goal:** To ensure the accreditation and licensing standards related to fall prevention are embedded in all programs and that programs are routinely evaluated to ensure they meet standards for current and emerging best practice.

**Rationale:** Evaluation, accreditation and licensing activities provide the information, standards and tools for improving program outcomes. Evaluation needs to occur at many levels: individual, facility, region-wide and provincial. In developing evaluation plans it is important to address the severity of falls as well as the number or falls and fallers.

Objectives	Strategies	Actions
1. To determine the effectiveness of current policies and practices in reducing falls and fall related injuries on a facility-wide basis.	1. Evaluate the effectiveness of implementing the fall CAPs in conjunction with other CAPs relevant to fall risk (see in RC Toolkit: <i>interRAI MDS CAPs</i> ).	Implement a fall standardized post-fall assessment and reporting system for all resident falls that record the date, time, location, activity at time of fall, nature of injury, as well as actions taken and recommendations for prevention of future falls (see in RC Toolkit: <i>PSLS</i> and <i>Fall Report</i> ).
	2. Using the facility-wide data collected on all falls and fall-related injuries, determine if effective changes were made to reduce the risk of falls (e.g., if falls were occurring frequently at a specific location, were environmental remedies put in place, or hazard removed).	Document and evaluate interventions and recommendations for prevention of future falls and use this data to monitor changes over time using the Plan/Do/Study/Act evaluation cycle and data from the <i>PSLS</i> or <i>Fall Report</i> .
	3. Implement an evaluation strategy to determine effectiveness of client, resident and staff education activities on reducing falls and fall related injuries.	Document education activities and evaluate effectiveness to determine if learning objectives were achieved.

Objectives	Strategies	Actions
<p>2. To improve the effectiveness of fall prevention plans at reducing falls.</p>	<p>1. Implement a routine facility-wide auditing system to determine if fall prevention plans are working as they are intended, including overall client and family satisfaction with quality of care and services (to be consistent with new <i>Provincial Performance Management Framework for Residential Care Facilities</i>).</p>	<p>Design, field test and implement auditing system. Evaluate efficacy of the system and adjust as required.</p>
<p>3. To ensure that knowledge gained through evaluation is shared across the system and used in planning system improvements.</p>	<p>1. Produce an annual report on the outcomes of the fall prevention plan, including changes in the number and rate of falls and related injuries, and changes in fall risk, e.g., changes in mobility status of persons in care (see in Toolkit tools listed under <i>Problem Identification and Risk Assessment</i>).</p>	<p>Integrate the existing reporting systems (e.g. interRAI MDS, PSLS or Fall Report, and Residential Performance Measurement Framework which includes client and family satisfaction with quality of care and services) to create a comprehensive and consistent reporting system for fall prevention outcomes.</p>

**References**

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## Chapter 5: Evaluating the Program

The evaluation of fall prevention programs in residential care is now a required step under the Accreditation Canada Required Operating Practices (Accreditation Canada, 2008). Specifically, the requirements related to evaluation are:

- The team evaluates the fall prevention strategy on an ongoing basis to identify trends, causes and degree of injury.
- The team uses the evaluation information to make improvements to its fall prevention strategy.

This chapter provides an overview of the evaluation process and steps, with recommendations for use in conducting the evaluation of a fall and fall-related injury prevention program in residential care. Most of the following content is adapted from the Canadian Falls Prevention Curriculum (Scott et al., 2007).

### Why Evaluate Your Program?

There are several reasons for evaluating your fall and fall-related injury prevention program. These include<sup>1</sup>:

- To determine what you have accomplished. For example: *Did staff in your training program increase their knowledge of falls prevention interventions?*
- To promote learning about which strategies work in learning about falls prevention and which don't. For example: *Did staff learn best through face-to-face instruction or through an internet course?*
- To contribute to the body of knowledge about fall prevention. For example: *What effect does use of an environmental checklist have on fall rates among seniors in your facility?*
- To support expansion of your program and/or illustrate why it needs continued funding. For example: *What were the costs and benefits derived from offering this program?*

A good program evaluation allows you to manage ongoing work, identify areas for improvement and successes, and plan effectively for new initiatives. Evaluation can be conducted by on-site staff or by an evaluation consultant. It can be conducted in isolation of those receiving or offering the program, or conducted using a participatory approach with involvement of the various stakeholders. A participatory approach is most in keeping with

health promotion principles, but it is not always feasible, nor practical to accomplish. The following section describes features thought to be common to participatory evaluation.

There are five evaluation questions can be applied to all types of program activities. The process of developing the answers to the evaluation questions will vary, as each project varies, but the five fundamental questions remain the same.

### Five Key Evaluation Questions

**What?** 1. Did we do what we said we would do?

**Why?** 2. What did we learn about what worked and what didn't work?

**So what?** 3. What difference did it make that we did this work?

**Now what?** 4. What could we do differently?

**Then what?** 5. How do we plan to use the evaluation findings for continuous learning?

### Stages of Evaluation

These five questions also correspond to the 4 stages of evaluation:

1. formative,
2. process,
3. impact and
4. outcome.

#### 1. *Formative Evaluation*

Formative evaluation helps determine whether or not a proposed program concept is appropriate or feasible, and it helps to develop or modify the program or project. It will provide information on how best to custom-design your program to the target audience, pre-test your strategies and make appropriate revisions. Conducting formative evaluation will increase the likelihood that a program will succeed. Formative evaluation steps include conducting a needs assessment, target group analysis and pre-testing.

- Needs assessment:
  - What is already being done?
  - What issues need to be addressed?
  - What resources are available?
  - How much support is there for an initiative?
- Target group analysis:
  - What are the best ways to reach the target group?
  - What strategies are known to work among the target group?
- Pre-testing:
  - How does the target group respond to the activities, messages and materials?
  - Are there any problems with the proposed activities, messages or materials?

## 2. *Process Evaluation*

Process evaluation describes what worked well in a program and what didn't work well; it evaluates the details of the planning and implementation process as it relates to the program's plans, procedures, activities and materials. By conducting process evaluation, problems can be identified early and adjustments or improvements can be made either before the program starts or throughout the program.

Process evaluation is not meant to tell whether the intended outcomes were met in terms of changes in knowledge, attitudes, skills, and a reduction in falls and injuries. However, process evaluation may help to explain why outcomes were, or were not, met. Questions answered through formative evaluation include:

- What did you do?
- Did you do what you intended to do?
- Did you reach your target group?
- How many did you reach?
- Is the program development and implementation occurring as planned?
- How well is the program organized?
- What was learned about the relative cost-effectiveness and efficiency of various project strategies and activities?
- In what ways did the program planning process work most effectively?

### 3. *Impact and Outcome Evaluation*

Impact and outcome evaluation measure a program's success in changing knowledge, attitudes, skills, behaviours, and target event – falls and injuries. Impact and outcome evaluation can reveal if things stayed the same, or if they changed for the better or worse.

Impacts and outcomes of a program are typically evaluated immediately after the program is completed; however, it is also important to evaluate the long-term outcomes by considering a repeat evaluation in six months, one year or longer to measure trends and lasting effects.

The ultimate outcome desired from falls prevention programs is a reduction in the frequency and severity of falls. This is why it is important to track these events as described in Chapter 1, *Defining the Problem*. However, the effect of a program can take time to show actual reductions of falls or fall-related injuries and it may be difficult to contribute direct cause and effect between your interventions and the outcomes. Therefore, don't discount the effect a program can have on knowledge, attitudes, skills or behaviours that can, in turn, effect falls.

For instance, there is proven evidence that poor vision can contribute to increased falls risk. Therefore, while the ultimate goal of a program might be to contribute to a reduction in the frequency of fall-related injuries, the desired impact or outcome of a project might be an increase in the number of residents receiving an annual vision test by an optometrist or ophthalmologist.

The following types of questions can be answered through impact and outcome evaluation:

- Was there a reduction in the number or rate of falls, fallers and fall-related injuries?
- What knowledge, attitudes, skills and/or behaviour changed as a result of the project?
- What evidence is there to attribute any of the above changes to the program? What other factors outside the program might have contributed to the changes?
- Were there any unexpected changes resulting from the program work? Describe them.
- What was learned that may have contributed to the outcomes or that may improve the effectiveness and sustainability of the program? Describe these.

## Evaluation Methods

### 1. Design

The start of a program is a good time to plan your evaluation and to decide on the design you wish to use. If you have the funds and wish to produce results that can be generalized to other settings, you will want to consider using an **experimental design**. This involves assigning people at random to study and control groups, and measuring change before and after your program. A control group helps you rule out the possibility that the observed changes occurred as a result of chance.

Many projects apply a **quasi-experimental design** where only some of the controlled conditions apply. An example would be a pre-test post-test design to an education intervention where participants are tested on their knowledge before and after a class. No control group or random assignment would be involved. This will evaluate aspects of your program but will not be generalizable and usually does not contribute to theory development in this field.

In other cases, you may want to opt for a **non-experimental design** using strictly qualitative data of people's experiences.

### 2. Success Indicators

The process of defining what constitutes success for a project is another important step in developing evaluations. Success indicators reflect a group's assumptions about what changes should be expected from doing the project work. These indicators are usually quantified by specific measures for example, a number, a percentage or a level of satisfaction.

Success indicators and their measures need to link directly to project goals and objectives since they provide the objective and measurable criteria by which groups judge the degree of success they have had in reaching their goals and objectives. To measure or evaluate the amount of change, it is useful to know the status of the target group's knowledge, attitudes, behaviour and skills at the beginning of the project.

Choosing which indicators are the "best" is not exact sciences. If you can build the data collection into the daily work of the project, and if people can use the results as part of their ongoing work, the evaluation effort will be seen to be more valuable and not just an add-on.

Success indicators should:

- Involve a meaningful , i.e., a comparison over time, a comparison with other similar activities or a comparison against a reasonable standard
- Be challenging but feasible

- Be measurable or observable, using quantitative or qualitative measures. In developing indicators, consideration should be given to data availability and data collection, given the resources available
- Refer to a result or outcome that can be reasonably attributed to the project activity
- Be as valid (directly related to the work done and not attributable to other factors) and reliable (able to be replicated)
- Meet the criteria of:
  - Selectivity, i.e., the number of indicators are limited to and focused on the key areas of concern
  - Balance, i.e., the indicators refer to a range of project activities and results that together will provide a balanced assessment of project success
  - Usefulness, i.e., the potential use of the evaluation information should be taken into account when developing indicators to ensure that they capture the relevant information.

### 3. *Collect Evaluation Data*

It is necessary to decide what information the project needs to collect to measure the indicators outlined above. You also need to determine who has the information and how the information will be collected. Sources of evaluation information can include staff and volunteers, target population or consumers of the service, advisory committee members, and other service providers.

#### *Characteristics of a Good Information Collection Process*

- useful
- practical
- collaborative
- systematic
- ongoing
- accurate
- ethical

#### *Information Collecting Tools*

There is a wide variety of information collection tools that can be used depending on the project's evaluation needs. Examples of quantitative and qualitative tools include:

- a) Written, Face-to-face and Telephone Surveys
  - structured questionnaires used to reach large numbers of people
  - provides quantitative data (numbers) that can be statistically analyzed and qualitative information that can be summarized

- used to survey target population in terms of knowledge, attitudes, beliefs and behaviour
- telephone and face-to-face surveys have the advantage of increasing accessibility and allowing immediate clarification of questions if the respondent is experiencing any difficulties.

When developing the questions for the questionnaire, ensure that they are not worded in ways that lead to biased or misleading responses. While mass mailing of survey questionnaires has the advantage of reaching large numbers of people, there is no guarantee that people will fill out and return it, so the actual response rate may be low. Limiting the number of questions may increase the response rate. Using smaller but targeted mailings, followed up by a phone call, may increase the response rate.

It is important to pay attention to respondents' literacy level, language and visual capacity. Survey questionnaires usually need to be pilot tested to ensure that the questions succeed in getting the information that is required.

#### b) Reaction Sheet

- Simple kind of questionnaire that asks questions about people's satisfaction with a particular activity.
- Easy and fast to administer and summarize.
- Useful tool for getting an immediate response to new resource materials, workshop models and public education events.

Avoid using leading questions that prompt positive responses. Instead of asking, "Did you enjoy the workshop?" ask, "On a scale of 1-10, how would you rate the group work activity in this workshop?" Include open-ended questions to obtain qualitative data. Shape these questions carefully to control the amount of material received. Examples: "Give three words to describe your reaction to this workshop." "What were the two key learning for you from this workshop?"

#### c) Focus Group

- Group discussion in which 8 to 12 people are brought together in a single session of one to two hours to generate ideas and suggest strategies.
- Facilitated using a specific agenda of structured questions that focuses the discussion in the meeting.
- Used to obtain in-depth understanding of attitudes, behaviour, impressions and insights (qualitative data) on a variety of issues from a group of people, e.g., project staff or a project advisory committee.

The facilitator must remain neutral and non-judgmental and have the skills to keep the discussion moving and on track. This is a particularly useful method for reflecting on evaluation findings and identifying key learning. It may also be useful for developing preliminary ideas for new programs or for testing messages that will be used in educational

d) Participant Observation

- Involves actual observation rather than asking questions.
- Used to better understand behaviours, the social context in which they arise and the meanings that individuals attach to them.
- Observers compile field notes describing what they observe; the analysis focuses on what happened and why.

This may be the most feasible way to collect data from some hard-to-reach populations (e.g., seniors with dementia who are attending an adult day care centre). As with all qualitative techniques, the results may not be generalizable to the entire study population.

e) Project Diary

- Project managers, staff or participants are asked to keep a record of their experiences while working on the project.
- Provides qualitative evaluation data.

It is important to provide the participants with clear guidelines on keeping a log book: the type of information you are looking for, how it will be used, confidentiality, etc. This is a useful method for identifying unintended consequences of a project. Some people are very uncomfortable with this method because of the unstructured nature of the writing required.

f) Non-traditional Methods of Documentation

- Non-verbal or non-written evaluation tools used to respect diversity and accessibility issues.
- Examples include cartooning, drawing, poster making, photography, videotaping, audio taping, scrapbooks.

Qualitative data may be difficult to analyze and it usually cannot be generalized to other programs. No single evaluation tool can provide all the evaluation information required. A combination of different tools that suit the project needs and available resources has to be developed.



#### 4. *Analyze and Interpret the Data*

As the evaluation data is collected, it should be summarized and analyzed and key learning should be identified. Most evaluation projects have no problem with collecting large amounts of evaluation information. What they sometimes do have difficulty with is effectively analyzing, summarizing and using the results. Use the data to demonstrate how well the project is doing, what is working, what should be done differently and what difference it is making.

For qualitative data, it is essential to stay with what people have said and let the data guide the analysis. Once the material has been grouped into themes, it can be analyzed to see how the results compare to the changes that were expected as identified by the success indicators. Take the time to reflect on what the analysis reveals. What was learned to answer the "what", "why", "so what", "now what" and "then what" evaluation questions? People who have been involved in the project should be involved in the interpretation of the findings.

#### 5. *Using Evaluation Results*

The fifth and final key evaluation question in the framework is, "How do we plan to use evaluation findings for continuous learning?" This is a question that needs to be considered at the very beginning of a project and not only at the end, as is often the case. Having ideas at the start of a project about uses for the evaluation findings helps ensure that the evaluation is conducted and the results reported in a way that meets people's needs. If key stakeholders are involved from the beginning, it increases their support for the process and their likelihood of using the results as they become available.

There are several major ways in which project evaluations can be used to maximize their benefit. A few ideas are listed below.

- Bring together all project staff on a quarterly basis to discuss the evaluation results and look at ways the results can be used to increase performance, improve project administration, enhance planning activities, etc.
- Develop a news release outlining the main leanings from the evaluation and some of its more important conclusions. Send the news releases to key community contacts and evaluation participants.
- Involve project participants in developing ways to present the project findings. Build on their stories and personal experiences to give a human face and to create interest in the evaluation results.
- Make a presentation on the evaluation results to the local health council or social planning group, highlighting the accomplishments and describing how the results can be used to promote better planning.

- Use the evaluation results to shape requests for new or continued funding or for suggesting alternative health practice models.
- Send a letter thanking all project participants for their work on the project and include a summary copy of the key evaluation results.
- Develop a short video of project participants discussing what they learned from the project. Use it to promote the project with community groups and with funders.
- Build the evaluation results into presentations to local service clubs to show how their funding support could be effectively used.
- Develop a workshop to present the project evaluation results at a regional or national conference of health promotion professionals.
- Identify other projects that are doing related work and share evaluation reports with them.
- Make presentations to other health care practitioners, using project evaluation results to show how they can benefit from involvement in health promotion work.

## Conclusions

This final chapter of the public health framework for fall and fall-related injury prevention focuses on the most important aspect of a program – determining if it made a difference. It is important to remember that evaluation does not just happen at the end of a project, but that it is integral at all stages of program planning and implementation. A good program evaluation allows you to manage ongoing work, identify areas for improvement, to celebrate successes, and to plan effectively for new initiatives.

Additional tools for evaluation are included in the Residential Care Toolkit that accompanies this report.

## References

- Accreditation Canada. (2008). Patient safety area 6: Falls prevention. Retrieved from <http://www.accreditation.ca/uploadedFiles/falls%20prevention.pdf>
- Scott, V., Lockhart, S., Gallagher, E., Smith, D., Asselin, G., Belton, L., & Duncan, B. (2007). *Canadian Falls Prevention Curriculum*. Vancouver, BC: BC Injury Research & Prevention Unit.

## Residential Care Fall and Fall-related Injury Prevention Toolkit

Available online in January 2011:

[www.hiphealth.ca/CEMFIA](http://www.hiphealth.ca/CEMFIA) or [www.injuryresearch.bc.ca](http://www.injuryresearch.bc.ca)

### **Listing of Tools**

#### **Data Sources**

1. BC Fall Report
2. Fraser Health Authority - Reportable Incident Form
3. Interior Health Authority - Incident Report
4. Northern Health Authority - Serious Incident Report
5. Vancouver Coastal Health Authority - Incident Report
6. Vancouver Island Health Authority - Incident Report
7. Resident Assessment Protocols: Falls
8. Falls Clinical Assessment Protocol
9. Patient Safety Learning System Report Form

#### **Assessment Tools**

1. Scott Fall Risk Screening Tool for Residential Care
2. Morse Fall Scale
3. Timed Up and Go
4. Sit to Stand Test
5. Berg Balance Test
6. Walkie-Talkie Test
7. Short Physical Performance Battery
8. Information from the Ontario MOHLTC Falls Prevention and Management and Care Planning

#### **Best Practices/Guidelines**

##### *Education*

1. Kiss of Life Multimedia and BUPA Healthcare Training for Staff in Care Homes
2. Canadian Falls Prevention Curriculum
3. Fraser Health Authority - Universal Fall Precautions
4. Interior Health Authority - Intervention Strategies for Residential Care
5. Interior Health Authority - Recognize the Risk
6. Vancouver Coastal Health Authority - What to do if you fall

*Equipment*

1. SATECH Cushioned Floors
2. Canadian Red Cross Equipment Sheets
3. Interior Health Authority – Wanted a Protected Hip

*Environment*

1. Minimizing Physical Restraints in Aged Care
2. Best Practice – Physical Restraint
3. Northern Health Authority – Best Practices Least Restraint
4. Restraint Prevalence Tools
5. Fraser Health Authority – Code Plus
6. Fraser Health Authority – Building Requirements

*Activity*

1. Fraser Health Authority – Presentation on Increasing Strength and Balance in Seniors
2. Activity and Aging Community of Practice - Recommended Practice Guidelines

*Clothing and Footwear*

1. Interior Health Authority – Feet/Footwear Review

*Health Maintenance – Medication*

1. College of Pharmacists of BC – Standards of Practice
2. Drugs and the Risk of Falling
3. Fraser Health Authority – Presentation on Medications and Falls
4. Interior Health Authority – Medication Review

*Health Maintenance – Continence*

1. Northern Health Authority – Best Practices Continence
2. Interior Health Authority – Continence Precautions
3. Fraser Health Authority – Presentation on Falls and Continence

*Health Maintenance – Bone Health*

1. Fraser Health Authority – Presentation on Bone Health in Seniors
2. 2010 Clinical Practice Guidelines for Diagnosis and Management of Osteoporosis in Canada: Summary

3. Dieticians of Canada: Food Sources of Vitamin D
4. Dieticians of Canada: Eating Guidelines for Osteoporosis

### **Program Examples**

1. Vancouver Coastal Health Authority – Initial Assessment for Care Planning
2. Vancouver Coastal Health Authority – Falls Prevention Care Plan
3. Vancouver Coastal Health Authority – Residential Care Post Fall Evaluation
4. Fraser Health Authority – Presentation on PDSA Planning
5. Fraser Health Authority – Joint Venture on Falls and Injury Reduction
6. RNAO National Collaborative on Falls in Long –Term Care
7. Canadian Falls Prevention Curriculum Program Implementation Worksheet

### *Clinical Practice Guidelines for Fall Prevention*

8. Fraser Health Authority
9. Northern Health Authority
10. Registered Nurses’ Association of Ontario
11. Vancouver Coastal Health Authority

### **Evaluation Tools**

1. BCIRPU Injury Prevention Program Evaluation Manual
2. Program Evaluation Presentation by Sharon Storschuk