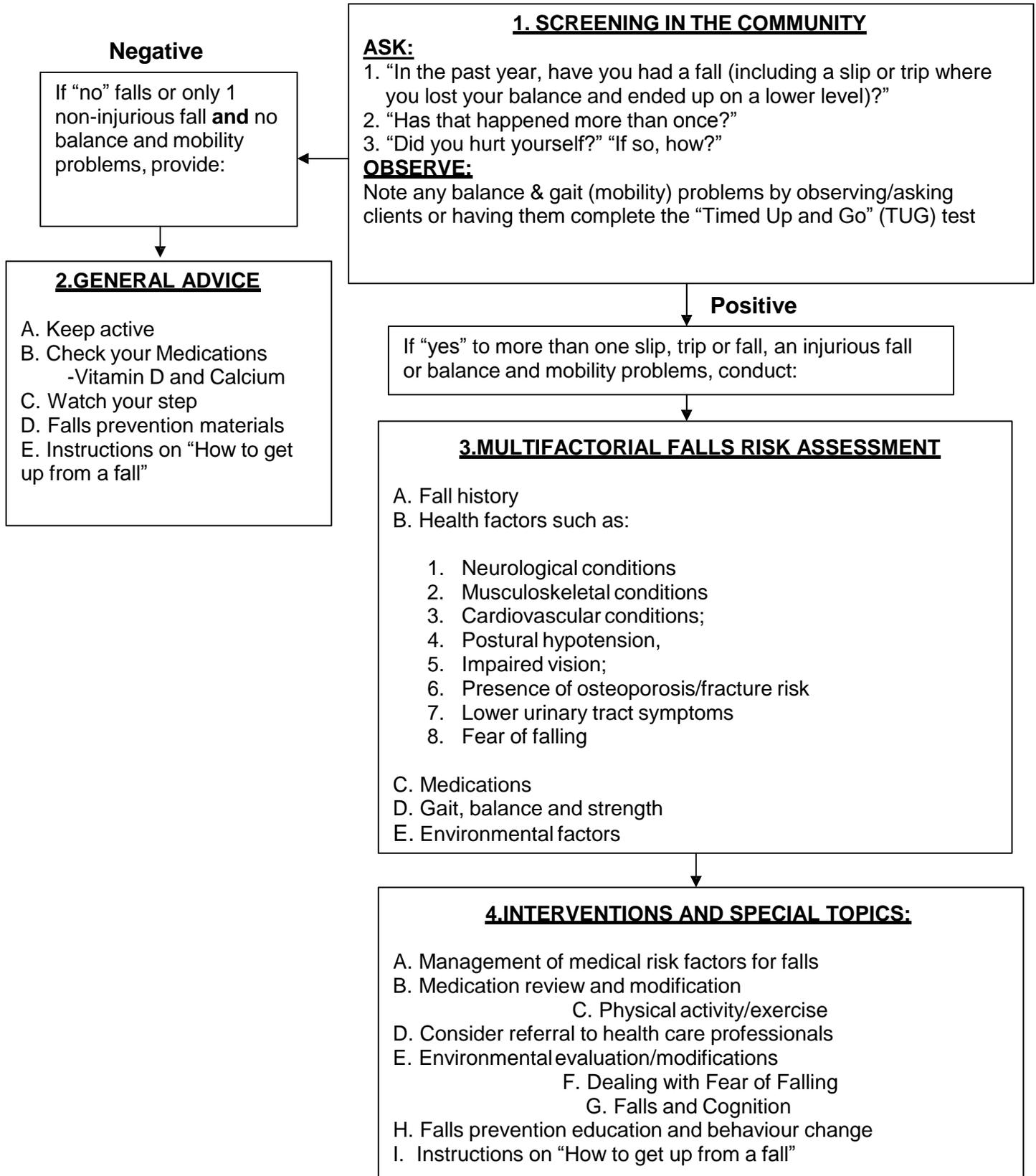


# A MULTIFACTORIAL APPROACH TO THE PREVENTION OF FALLS IN OLDER ADULTS (65 years and older)



Resources for Practitioners:

- Seniors' Falls Injuries in Ontario <http://www.oninjuryresources.ca/>
- American Geriatric Society British Geriatric Society  
<http://www.medcats.com/FALLS/frameset.htm>

## **1. SCREENING IN THE COMMUNITY:**

### **Ask**

1. "In the past year, have you had a fall (including a slip or trip where you lost your balance and ended up on a lower level)?"
2. "Has that happened more than once?"
3. "Did you hurt yourself?" "If so, how?"

### **Observe**

Note any balance & gait (mobility) problems by observing clients or having them complete the "[Timed Up and Go](#)" (TUG) test or the "[Get Up and Go](#)" test. "[Timed Up and Go](#) Test Video

### **Positive**

If "yes" to more than one slip, trip or fall, an injurious fall or balance and mobility problems, conduct Multifactorial Falls Risk Assessment

### **Negative**

If "no" falls or only 1 non-injurious fall **and** no balance and mobility problems, provide General Advice

## **SCREENING IN ACUTE CARE**

There are a few fall risk screening tools that have been validated for use in the acute care setting. Ensure users are oriented to their correct use and scoring. Some examples of screening tools are:

- [Schmid Fall Risk Assessment Tool](#)
- [Morse Fall Scale](#)
- [STRATIFY](#)

## **SCREENING IN CONTINUING CARE**

For residents in the continuing care setting, it is felt by many that *all residents are assumed to be at risk to fall*, and therefore 'screening' is not necessary or helpful. For this reason, clinicians often do not *screen*, but instead move directly to the multi-dimensional *assessment* of residents' fall risk.

## **2. GENERAL ADVICE:**

### **2A. Keep Active**

- According to the World Health Organization the greatest health risk for older adults is living an inactive life.
- Physical activity can prevent the onset of impairments which lead to an increased risk for falls.
- Healthy older adults should participate in at least 30 minutes of moderately hard activity on most or all days of the week. A moderately hard activity is one where heart rate is increased and the person can still talk while doing the activity. Older adults should speak to their physician prior to participating in any new physical activity.
- Older adults should participate in activities which are enjoyable but which will also maintain strength, balance, endurance, coordination and flexibility. There are many programs for healthy older adults to choose from such as Tai Chi, strength training, walking, water fitness, and dancing.

Resources for Practitioners:

- [Preventing Falls through Physical Activity: A Guide for People Working with Older Adults](#)
- [Active Living Coalition for Older Adults](#)
- [Ontario Fitness Council](#)
- [Move 'n Mingle](#)
- [Canadian Society for Exercise Physiology](#)
- [Factors to Consider When Choosing a Trainer](#)

Examples of Resources for Clients

- [Be Falls Smart in What You Do - Physical Activity](#)
- [Active Independent Aging: A Community Guide for Falls Prevention and Active Living](#)
- [Canada's Physical Activity Guide to Healthy Active Living For Older Adults](#)
- [The Rural Route to Active Aging](#)

Link to Programs in Ontario

- [211 Ontario](#)
- [Finding Balance Ontario](#)

### **2B. Check your Medications**

- All medications including prescription, over-the counter, vitamins, herbs and other natural health products should be reviewed by a doctor, nurse practitioner, or pharmacist annually.
- As people age, the way some medications work can change and increase the risk of falling.
- Tools are available to assist older adults to keep track of medications and to think of questions to ask their health care professional.

## 1. Vitamin D and Calcium

- Individuals can be referred to their physician or health care provider to find out if they are at risk of vitamin D deficiency or osteoporosis. Although osteoporosis is not usually the direct cause of falls, bone health should be optimized to minimize the chance of a fracture with a fall. Optimal intakes of calcium and Vitamin D are factors contributing to bone health. Low Vitamin D levels are associated with decreased muscle strength, poorer physical performance and a higher rate of falls as well as increased risk for osteoporosis.
- For adults age 50 years and older Osteoporosis Canada recommends 1200 mg of elemental calcium daily. This includes the amount of calcium consumed in foods or beverages, as well as supplements. Calcium is best absorbed when taken in smaller doses (e.g. 500 mg per dose). The amount of calcium in foods can be found at: [http://www.osteoporosis.ca/index.php/ci\\_id/5535/la\\_id/1.htm](http://www.osteoporosis.ca/index.php/ci_id/5535/la_id/1.htm)
- Osteoporosis Canada recommends that adults over the age of 50 who are at risk of Vitamin D deficiency should receive at least 800-1000 units of vitamin D as a supplement and that doses up to 2,000 units per day would be safe with no requirement for monitoring.
- Daily Recommended Intakes (DRI) are aimed at a generally healthy population - they are not therapeutic recommendations. The recent Clinical Practice Guidelines released by Osteoporosis Canada (2010) (see <http://www.osteoporosis.ca>) and endorsed by Dietitians of Canada are not at odds with the revised DRI for calcium and vitamin D. It is important that those individuals at risk for osteoporosis, or who are under treatment for this disease, should have their nutritional intake evaluated by a Registered Dietitian and appropriate counseling provided to ensure that intake is aligned with the Clinical Practice Guidelines.

## 2. Alcohol

- As people age, their bodies do not break down alcohol as efficiently. It is best to minimize the use of alcohol as even a small amount could increase the risk of falling.
- The combination of alcohol and a sedating medication like a sleeping pill is particularly risky. If older adults are unsure about the amount they can safely drink, they should speak to their doctor, pharmacist or nurse practitioner.

Resources for Practitioners:

- [Drugs and The Risk of Falling](#)
- [Toward Optimized Practice \(TOP\) Clinical Practice Guidelines for the Diagnosis and Management of Osteoporosis](#)

Examples of Resources for Clients

- [Be Falls Smart in What you Do - Medications](#)
- [Knowledge is the best medicine](#)
- [Medication Record Book](#)
- [Dietitians of Canada](#)
- [Health Canada](#)
- ['It's Okay to Ask'](#)
- [Sleep Hygiene](#)
- [Telehealth Ontario](#) 1-866-797-0000 TTY : 1-866-797-0007

## 2C. Watch your Step

- Older adults can use a home safety checklist to examine their home for environmental risks.
- If risks are identified in or outside the home and assistance is needed to remedy the risk, older adults can call: 211
- In situations where older adults or their families are unable to perform a home safety check list and when older adults at high risk for falls are discharged from hospital, a referral to an occupational therapist or Home Care clinician may help to address environmental risk factors. Contact your local Community Care Access Centre (CCAC) at 310-CCAC (2222).
- While in-home assessments require more resources, it has been found that clients who received in-home assessments were more likely to be motivated to act on the information and implement the changes.
- Older adults should have their vision checked annually. Conditions like macular degeneration, glaucoma, cataracts or wearing glasses with an incorrect prescription can limit vision and increase the risk of falling.
- Wearing supportive shoes and clothing that does not drag on the floor can reduce the risk of falling.
- Outdoor hazards and hazards in public buildings should be reported to local government.

Examples of Resources for Clients:

- [Have a Safe Home](#)
- [Check for Safety - A Home Fall Prevention Checklist for Older Adults](#)
- [Be Falls Smart in Your Home](#)
- [Be Falls Smart in Your Community](#)
- [Be Falls Smart in Footcare and Footwear](#)
- [Be Falls Smart in Using Transportation](#)
- [Be Falls Smart in What You Do](#)
- [Ideal Shoe](#)
- [Stair safety](#)
- [Winter safety](#)

## 2D. General Falls Prevention Materials

These sources of information will provide general falls prevention information for older adults:

- [Take Action - Prevent a Fall Before it Happens](#)
- [A Million Messages for Seniors' Falls Prevention](#)
- [Active Independent Aging - A Community Guide for Falls prevention and Active Living](#)

## 2E. How to Get up From a Fall

Older adults are often unsure of how to get up from a fall. Information on [how to safely get up](#) or [how to safely help someone else get up](#) may be downloaded here. Have the client practice this in your presence whenever possible. Printable copies of resources on how to get up from a fall are available in multiple languages on the Finding Balance website under the “Practitioner” tab.

### **3. MULTIFACTORIAL FALLS RISK ASSESSMENT**

- Older adults with a positive fall risk screen should have a **multifactorial falls risk assessment** performed to identify predisposing and precipitating factors. Individualized interventions based on the assessment can then be implemented for the identified modifiable risk factors.
- Detailed assessments are often completed by the health care professional with the most expertise in that specific area. The critical point is that the multifactorial assessment should be done by a clinician (or clinicians) with the skills and competencies required. In certain circumstances a referral to a specialist (e.g., geriatrician) or a specialty service (e.g., Falls Clinic) may be required.
- The success of the assessment depends on whether the recommendations arising from it are acted upon. Suggestions to alter behaviours that increase fall risk for the older person have to be presented in a manner likely to induce behavioural change.
- Assessment tools can be used to tailor interventions to individual risk profiles. There is no one assessment tool that addresses all risk factors.
- While **screening tools** have been used to predict the level of risk of falling (low, medium and high), they do not predict which people from these groups will actually fall. There has been controversy about the use of these tools.
- If seen immediately after a fall, the older adult should be examined for signs of physical injury. Some organizations have a formal post-fall assessment protocol. (See 3A for examples)
- Before deciding on tools to be used for screening for fall risk, identifying fall risk factors, or assessing identified risk factors, consider the following: purpose, cost, ease of use, training requirements, potential for acceptance, evidence of reliability and validity, and consistency of content with known risk factors.
- A comprehensive multi-factorial fall risk assessment has many components. There are many tests that have been shown to have good validity and reliability in different settings when used by those trained in their use. Some of these tests, as identified by the Canadian Fall Prevention Curriculum [2007], include:
  1. Community - Timed Up and Go Test, 5-minute Walk, 5-step Test, Functional Reach, Clinical Test Sensory Interaction for Balance, Floor Transfer, Maximum Step Length
  2. Supportive Housing - BERG Balance
  3. Residential - Mobility Fall Chart, Area Ellipse of Postural, Tinetti Balance Subscale
  4. Acute Care - Schmid Fall Risk Assessment, STRATIFY, Morse Falls Scale

Note that all of these tools listed above are considered 'screening' tools, but they can be used to lead in to a more in-depth fall risk assessment. Each, by itself, does not constitute a multi-factorial fall risk 'assessment'.

#### Resources for Practitioners

- Examples of Falls Risk Screening Tools for Acute Care Settings
  - [Schmid Fall Risk Assessment Tool](#)
  - [Morse Fall Scale](#)
  - [STRATIFY](#)

### 3A. Falls History

A history of falls and their circumstances should be completed including date, time of day, location, and circumstances (e.g. what the client was doing at the time of a fall, person's perception as to the cause, associated symptoms preceding and after the fall), injuries, post-fall interventions, and severity and duration of any changes in ADL/mobility status and in client's confidence walking/fear of falling. Resources for Practitioners:

Examples of post fall history forms/reviews:

1. [SPLATT](#)
2. [Acute Care Post Fall Review](#)
3. [Assisted Living Facility Post Fall Review](#)
4. [Assisted Living Post Fall \(or Status Change\) Process](#)
5. [Critical Thinking Document: Fall Risk Factors in Acute Care](#)
6. [Critical Thinking Document: Fall Risk Factors in Assisted Living Facilities](#)

### 3B. Health Factors

Many health factors can contribute to fall risk and be screened. Assessments should be done by a clinician with the required skills and competencies in that area.

Client history should include:

- Medications (See section 3C for more detail)
- Use of alcohol including nightcaps
- Acute and/or chronic medical problems
- Functional abilities (assessment of basic and instrumental activities of daily living)
- Mobility
- Lower urinary tract symptoms (urinary urgency, frequency, nocturia and urge incontinence )

Physical exam should include:

1. A targeted neurological examination including mental status, lower extremity strength (e.g., can the patient stand from sitting without using their arms?), vestibular function (e.g., detection of movement-provoked dizziness by first shaking the head side-to-side and then nodding it up and down, head impulse test if trained to do it and there are no contraindications such as severe cervical arthritis), lower extremity sensation & reflexes, search for extrapyramidal signs (e.g., tremor, rigidity, akinesia, and postural instability – TRAP), and coordination.
2. A targeted musculoskeletal examination focusing on the lower extremities (joints, range of motion, pain, deformities) and feet/footwear (foot problems, especially painful ones such as plantar fasciitis and multiple ones, are associated with an increased risk of falling; in-home falls have been associated with being barefoot or wearing socks without shoes and slippers)
3. A cardiovascular examination including heart rate and rhythm, and postural pulse and blood pressure

#### 4. Assessment for orthostatic (postural) hypotension:

- To assess for orthostatic hypotension have the client lying down for between 5 to 10 minutes, and then measuring blood pressure while standing. Orthostatic hypotension is present if there is a drop of at least 20 mm Hg in systolic blood pressure or of at least 10 mm Hg in diastolic blood pressure within 3 minutes of standing. Measuring after sitting (not lying) will miss some cases. There is some controversy regarding how long to wait after standing before measuring BP. Generally the standing BP is measured at 1 minute (for screening purposes a single 1 minute reading is usually sufficient) and 3 minutes after standing.

#### 5. Impaired vision

- A process to ensure regular vision assessments may be helpful. Assessments should ideally include:
  - Acuity
  - Contrast sensitivity
  - Depth perception
  - Visual field loss
  - Glasses – check if using multifocal/ bifocal and/or transition (photochromic) lenses

Some aspects of a thorough visual assessment (e.g., contrast sensitivity, depth perception, visual field losses) especially if the deficits are subtle would require the involvement of an optometrist or ophthalmologist.

#### 6. Assessment for osteoporosis

- Ask about osteoporotic fractures and any prior bone mineral density determinations. Ask about historical heights and measure current height. See what the difference might be. A historical height loss of > 6 cm suggests the presence of vertebral fractures.
- Measure the occiput-to-wall distance. An occiput-to-wall distance of > 5 cm indicates the presence of kyphosis possibly from vertebral fractures
- Check rib to pelvis distance. Two finger's breadth or less suggests the presence of vertebral fractures. (2010 Clinical Practice Guidelines for the Diagnosis and management of Osteoporosis in Canada)

#### 7. Lower Urinary Tract Symptoms (LUTS):

- Certain LUTS (i.e., urge incontinence, mixed incontinence, overactive bladder symptoms like frequency and urgency, nocturia 2-3+ per night) are associated with a moderate (i.e., 1.3-2.0 fold) increase in the risk of falls among older individuals.<sup>1-4</sup> The association with overactive bladder symptoms and falls could be explained by rushing to the toilet and/or the distress/anxiety related to the aftermath of not being able to get to the toilet in time. The cognitive demands of performing multiple tasks simultaneously such as walking quickly, concentrating on controlling the flow of urine, and negotiating household obstacles in order to get to the toilet are not trivial and may have detrimental effects on balance in older individuals. Sleep patterns can be altered by nocturia. Disruptive sleep might lead to day-time

symptoms such as dizziness and drowsiness. Poorly lighted night-time journeys to the toilet in a drowsy state after rapidly going from lying to standing could be associated with falls. Slipping on urine could be a rare cause of falls.

- There are stronger individual risk factors for falls such as a history of falls and balance/gait abnormalities. The prevalence of LUTS and falls both increase with age - their occurrence together could be from chance. Any association between falls and incontinence could be due to common risk factors (e.g., limited mobility, cerebrovascular disease). The effect of treating LUTS on subsequent fall risk is currently unknown. First-line potential interventions would include behavioural strategies and lifestyle measures. Medications (e.g., anticholinergics,  $\alpha$ -blockers) would be an option but might increase fall risk themselves because of potential adverse effects (e.g., dizziness, orthostatic hypotension, cognitive dysfunction and/or impaired psychomotor performance from central anticholinergic effects).
- Older patients being evaluated for falls should be asked about LUTS. A questionnaire such as the Bladder Control Self-Assessment Questionnaire (B-SAQ) could be used. If relevant symptoms are detected, interventions to further assess and/or treat them should be considered as part of the treatment plan.

#### G. Assessment of Fear of Falling

- A variety of other factors increase the risk of future falls including fear of falling, which can be assessed using the Falls Efficacy Scale-International (FES-I).

Section 4A discusses *interventions* regarding medical management. Section 4F discusses *interventions* regarding fear of falling.

#### Resources for Practitioners:

- [Examples of Toward Optimized Practice \(TOP\) Clinical Practice Guidelines for the Diagnosis and Management of Osteoporosis](#)
- Examples of cognitive assessments include: [Standardized Mini-Mental Status Exam \(SMMSE\)](#), [Montreal Cognitive Assessment \(MoCA\)](#)
- Overactive Bladder Awareness (OAB) Tool (Add link [www.oabq.com](http://www.oabq.com))
- The Bladder Control Self-Assessment Questionnaire (B-SAQ)
- Overactive Bladder Tool

#### Examples of Resources for Clients

- [Managing Postural Hypotension](#)

### 3C. Assessment of Medications

- A comprehensive medication review by a physician, nurse practitioner, or pharmacist should be conducted on all older adults who have had multiple falls and /or an injurious fall.
- All medications, their doses and frequency of use should be reviewed at least annually.

- In clinical practice there is continuous weighing of the relative benefits and risks of the medications that are prescribed. It may not be possible to eliminate medications that increase the risk for falls because they are necessary for other health problems.
- The medication review should include the following:
  1. List of medical conditions/diagnoses/health problems
  2. Medications prescribed
  3. Non-prescription medications
  4. Natural health products
  5. Description of how the client is actually taking the drug products
  6. Identification of any condition not treated or undertreated
  7. Identification of any drug product without an indication
  8. Identification of any drug being misused (e.g. excessive duration or dose)
  9. Identification of any high-risk medication being used
  10. Review of treatment for bone health including over the counter Calcium and Vitamin D
- A medication review can be done in the community, hospital, or institutional setting.
- Information about medications (including requests for reviews) should be communicated during transitions in care and should be provided to the older adult and/or caregiver.

Example: if a client is started on a benzodiazepine in hospital, it should be re-evaluated upon discharge as it may not be required long-term.

- Older patients on 4+ prescription medications have a higher risk of falling than those taking fewer medications. However, the number is perhaps less important than considering the type, duration and dosage.
- Certain types of medications are associated with a higher risk of falling. **High risk medications** include:
  1. sedative-hypnotics (e.g. benzodiazepines and other sleeping pills)
  2. antidepressants (e.g. tricyclic antidepressants, selective serotonin reuptake inhibitors)
  3. neuroleptics (also known as antipsychotics or tranquilizers)
- Drugs of moderate/low risk include:
  1. Anticonvulsants
  2. Cardiovascular agents that lower blood pressure such as antihypertensives (in general), anti-arrhythmic medications (e.g. digoxin), beta-blockers, peripheral vasodilators, and nitrates are more weakly associated with a risk for falls.
- Medications used inappropriately, such as opioids (narcotics) or oral hypoglycemia agents and insulin, may increase the risk for falls.
- Eye drops or gels may also increase fall risk if they adversely affect vision.
- As people age, their bodies do not break down alcohol as efficiently. It is best to minimize the use of alcohol as even a small amount could increase the risk of falling. Combining alcohol with sedatives is not recommended. Alcohol, including beer, wine, spirits and night caps, can have this effect. If older adults are unsure about the amount they can safely drink, they should speak to their doctor, pharmacist or nurse practitioner.

Resources for Practitioners:

- [Drugs and The Risk of Falling](#)
- [Calcium supplements](#)

Section 4B discusses *interventions* regarding medication management.

### **3D. Assessment of Gait, Balance and Strength**

- Screening tools such as the Timed Up and Go test are used to predict risk to fall and can be used by any health care provider trained in their use.
- Once an older adult has been identified as having decreased lower extremity strength or impaired balance and /or gait through initial fall risk screening tools or simple observation, then the client should be referred to a physiotherapist for a detailed assessment of the physical factors which may be contributing to fall risk.
- Assessment tools are used to evaluate the components of impaired balance, decreased strength and abnormal gait and need to be chosen for how well they are able to detect the individual's impairments.
  1. No one test is able to assess all components.
  2. Examples of standardized tools available to a physiotherapist would be (but not limited to):
    1. BERG Balance Scale
    2. Fullerton Advanced Balance Scale
    3. Dynamic Gait Index
    4. 50'/30' walk test
    5. Seniors Fitness Test
    6. Modified Clinical Test of Sensory Integration of Balance
    7. Chair Stand test (also called 30 Second Sit Stand)
- A comprehensive physiotherapy assessment would include assessment of the systems essential for balance including the motor, sensory and cognitive systems.
- This assessment could include tests to determine:
  1. Lower extremity strength
  2. Balance (dynamic and static)
  3. Sensory impairment
  4. Range of Motion
  5. Endurance
  6. Posture
  7. Coordination
  8. Flexibility
  9. Functional ability
  10. Foot examination
  11. Pain
  12. Ability to divide attention between two tasks
  13. Upper extremity strength
  14. Vestibular Function - Some physiotherapists are able to provide a vestibular assessment for clients

Section 4C discusses *interventions* regarding management of gait, balance, strength, and mobility impairments.

### **3E. Assessment for Environmental Hazards**

- Older adults can use a home safety checklist to examine their home for environmental risks. If risks are identified in or outside the home and assistance is needed to remedy the risk, older adults can call: 211 or 310-CCAC (2222)

- In situations where older adults or their families are unable to perform a home safety check list or where an older adult is being discharged from hospital following an admission for a fall-related fracture and/or with decreased mobility, a referral to an occupational therapist or Home Care clinician may help to address environmental risk factors. Contact your local Community Care Access Centre or rehab practitioner.
- While in-home assessments require more resources, it has been found that clients who received in-home assessments were more likely to be motivated to act on the information and implement the changes.
- There are screening environmental assessments that can be done by any health care provider. One standardized evaluation tool that any health provider can use is called the Home Falls and Accidents Screening Tool (Home FAST). It is a 25 item checklist and has established reliability and validity.
- Older adults may be unaware that many assistive devices can be fully or partially funded. Contact Home Care or a local rehab provider for information regarding funding sources.
- A referral to an occupational therapist (OT) may be appropriate for older adults identified as having feet and footwear issues, numerous environmental hazards, and challenges with transfers, or if cognition or perception appears to be impacting their ability to safely get around in their environment. See section 4D.
- If the individual has severe visual impairment, identification and modification of environmental hazards by an occupational therapist can decrease the risk of further falls. Also a referral to CNIB may be of benefit. Another resource for visually impaired clients is:
  1. [The American Foundation for the Blind](#)

Resources for Practitioners:

- Screening environmental assessments:
  1. [Home Falls and Accidents Screening Tool \(Home FAST\)](#)
- [Foot Assessment](#)
- [Footwear Assessments](#)
- [Ontario Society of Occupational Therapists - Perceptual Evaluation](#)

Examples of Resources for Clients

- [Have a Safe Home](#)
- [Check for Safety - A Home Fall Prevention Checklist for Older Adults](#)
- [Stair safety](#)
- [Winter safety](#)

Section 4E discusses *interventions* regarding environmental hazards.

## **4. Interventions and Special Topics:**

As not all falls can be prevented, strategies for injury reduction must be considered in some situations. These situations can include individuals with dementia and poor short term memory. Examples of injury reduction strategies include the use of protective equipment such as hip protectors and cushioned floor surfaces. Low bed positions, decreasing clutter to ensure a clear pathway to the bathroom, and light sensitive lighting are other recommendations.

#### 4A Medical Factors

The specifics of this would depend very much on what medical fall risk factors are identified (or suspected). The following is some advice for a number of the more commonly identified factors.

- Impaired vision
  1. Ensure ample lighting indoors without glare. Use soft white bulbs, indirect lighting, and blinds.
  2. Consider contrast to mark the edge of stairs, as well as contrast on handrails, doorframes and grab bars.
  3. Avoid wearing reading glasses while walking. Multifocal/ bifocal glasses can impair contrast sensitivity, depth perception and lead to a loss of visual acuity in the lower peripheral visual fields. A recent study indicated that provision of single lens glasses for older wearers of multifocal glasses who regularly take part in outdoor activities can decrease the risk of falls. This intervention may be harmful, however, in multifocal glasses wearers with low levels of outdoor activity
  4. Tinted and transition (photochromic) lenses can decrease glare when active outside but might reduce acuity when inside. With photochromic lenses, the transition time can be up to two minutes when moving from a bright to a darker environment. Older people should be advised against fixed tinted glasses and should be aware of the delayed change with some photochromic lenses.
  5. If the person has severe visual impairment, identification and modification of environmental hazards can decrease the risk of further falls.
  6. Refer to an ophthalmologist-if impaired vision is from cataracts, expedited surgery for the first cataract can reduce the risk for falling and sustaining a fracture.
- Treatment of postural hypotension
  1. Diagnose the underlying cause and manage it.
  2. Review medications: reduce and try to stop medications suspected as causing or contributing to the problem when appropriate.
  3. Ensure adequate fluid intake especially when febrile, during a bout of the "stomach flu," and in hot weather.
  4. Modification of salt restriction when appropriate.
  5. Use compensatory strategies (e.g. elevate head of the bed, rise slowly, dorsiflex feet before getting up).
  6. Use pressure gradient stockings (preferably thigh high) where appropriate.
  7. Consider pharmacological therapy (e.g., fludrocortisone, midodrine) if above unsuccessful and no contraindications.
- Treatment of dizziness Management depends on the likely cause. You would initially try to categorize the patient's complaint of dizziness as being vertigo (false sense of motion/ often described as a spinning or whirling sensation), disequilibrium (feeling off-balance or wobbly), and presyncope (feeling that you are lightheaded, going to black-out or faint). Many patients, though, are hard to categorize and/or have multiple forms of dizziness. Causes of vertigo would include Benign Paroxysmal Positional Vertigo (BPPV). This leads to episodic vertigo without hearing loss and can be diagnosed with the Dix-Hallpike maneuver. The Epley maneuver and vestibular rehabilitation are effective forms of therapy for BPPV. Orthostatic (or postural) hypotension would be a possible cause of presyncope (see preceding section on the treatment of postural hypotension). There are multiple possible causes of disequilibrium such as cerebrovascular disease, Parkinson's disease, sensory impairments (e.g., peripheral

neuropathy), and adverse effects to medications. Management would be directed by the likely cause. Help may be required to diagnose and treat this complaint.

- Treatment of cardiovascular disorder
  1. If syncopal falls are suspected, refer to a cardiologist.
- Footwear – As general advice, older persons should wear shoes with low heels and firm slip-resistant soles both inside and outside the home.
- Treatment of Osteoporosis
  1. Refer to Clinical Practice Guidelines for the Diagnosis and Management of Osteoporosis
  2. Hip protectors (a device that absorbs and/or shunts away the energy of the impact of a fall from the greater trochanter) may have a role in preventing hip fractures among those at high risk of falls who are willing and able to wear them. High risk older adults in long-term care facilities may benefit from the use of them but their utility in preventing hip fractures among older adults in the community remains unproven.
  3. Regardless of the setting, keep in mind that:
    - A) The clinician recommending their use needs to spend time educating and motivating their client to wear them as poor adherence has been a major barrier to their use.
    - B) Hip protectors only help when they are worn and positioned over the greater trochanters.
    - C) Hip protectors can be worn like underwear or on top of underwear
    - D) If interested, contact local medical supply companies to obtain information on brands and costs.
    - E) HipSaver and Safe Hip brands hip protectors have been recommended based on their biomechanical and clinical performances.

#### Resources for Practitioners

- [Toward Optimized Practice \(TOP\) Clinical Practice Guidelines for the Diagnosis and Management of Osteoporosis](#)

#### Examples of Resources for Older Adults

- [Managing Postural Hypotension](#)
- [Hip Protectors](#)
- [Vision Care](#)

#### **4B Medication Review and Modification**

- Health care providers should encourage older adults to carry a list of all their medications (including prescription, over-the counter, vitamins, herbs and other natural health products) and to periodically review them with their professional health care providers.

- Falls are associated with the use of medications but the effect of the medication can be confounded by the indication. For example, a medication used to treat depression can increase the risk of falling, but depression itself is a risk factor.
- In clinical practice there is continuous weighing of the relative benefits and risks of the medications that are prescribed. It may not be possible to eliminate necessary medications that increase the risk for falls. However, other interventions such as education, behavioural change, and environmental modifications can be used to reduce falls risk. For example, cardiac medications may be necessary to control heart rhythm, reduce blood pressure, or decrease the risk of a stroke or heart attack. However, some of these medications can cause side effects such as low blood pressure, and poor balance. In this case, education about moving cautiously and changing the environment (such as placing a Sask-A-Pole by the bed) may be done.
- Older clients on 4 or more prescription medications have a higher risk of falling than those taking fewer medications, but all medications taken by a client/ patient at risk for falls should be assessed re the relative benefits and risks of persisting with them. When reviewing medications, ask yourself:
  - Are these drugs still required?
  - Is there a non-pharmacological approach for this problem?
  - Can I switch the client/ patient to a less hazardous medication that would have the same intended effect or minimize the dose being taken and still get the desired effect?
- Certain types of medications are associated with an increased risk of falling. **High risk medications** are sedative-hypnotics (e.g. benzodiazepines and other sleeping pills), antidepressants (e.g. tricyclic antidepressants, selective serotonin reuptake inhibitors), and neuroleptics (also known as antipsychotics or tranquilizers). **Moderate risk medications** that are more weakly associated with falls would include anticonvulsants and cardiovascular agents (i.e., antihypertensives, anti-arrhythmic medications, beta-blockers, peripheral vasodilators, nitrates).
- As noted in the Assessment section, a comprehensive medication review by a pharmacist, physician, or nurse practitioner should be conducted on all older adults identified as being at high risk for falls..
- Gradual withdrawal (or dosage reduction to the lowest effective dose if discontinuation is not possible) of psychotropics and other drugs associated with an increased risk of falling have been found to reduce the likelihood of further falls. Consider consulting a pharmacist in your efforts to reduce medications. Their assistance can be invaluable in mapping out an approach to gradually withdrawing psychotropics and other drugs associated with an increased risk of falling.
- There is a high prevalence of vitamin D deficiency among older adults.
- Individuals can be referred to their physician or health care provider to find out if they are at risk of vitamin D deficiency or osteoporosis. Although osteoporosis is not usually the direct cause of falls, bone health should be optimized to minimize the chance of a fracture with a fall. Optimal intakes of calcium and Vitamin D are factors contributing to bone health. Low Vitamin D levels are associated with decreased muscle strength, poorer physical performance and a higher rate of falls as well as increased risk for osteoporosis.
- For adults age 50 years and older Osteoporosis Canada recommends 1200 mg of elemental calcium daily. This includes the amount of calcium consumed in foods or beverages, as well as supplements. Calcium is best absorbed when taken in smaller doses (e.g. 500 mg per dose). The amount of calcium in foods can be found at: [http://www.osteoporosis.ca/index.php/ci\\_id/5535/la\\_id/1.htm](http://www.osteoporosis.ca/index.php/ci_id/5535/la_id/1.htm)
- Osteoporosis Canada recommends that adults over the age of 50 who are at risk of Vitamin D deficiency should receive at least 800-1000 units of vitamin D as a

supplement and that doses up to 2,000 units per day would be safe with no requirement for monitoring.

- Daily Recommended Intakes (DRI) are aimed at a generally healthy population - they are not therapeutic recommendations. The recent [Clinical Practice Guidelines](#) released by Osteoporosis Canada (2010) (see <http://www.osteoporosis.ca>) and endorsed by Dietitians of Canada are not at odds with the new DRI report on calcium and vitamin D. It is important that those individuals at risk for osteoporosis, or who are under treatment for this disease, should have their nutritional intake evaluated by a Registered Dietitian and appropriate counseling provided to ensure that intake is aligned with the Clinical Practice Guidelines.

Resources for Practitioners:

- [Drugs and the Risk of Falling](#)
- [Calcium supplements](#)

Examples of Resources for Clients

- [Be Falls Smart in What you Do - Medications](#)
- [Knowledge is the best medicine](#)
- [Medication Record Book](#)
- ['It's Okay to Ask'](#)
- [Sleep Hygiene](#)

#### **4C Physical Activity/Exercise**

General advice for older adults who have not had a fall and who have no strength, gait or balance disturbance

- Refer to: Section 2- General Advice

Good Practice Point:

- When exercise/physical activity prescription is provided in writing by a healthcare professional, older adults are more apt to follow through with these programs.

Resources for Practitioners:

- Refer to: Section 2- General Advice

Examples of Resources for Clients

- Refer to: Section 2- General Advice

Link to Programs in Ontario

## Management of weakness and/or impaired gait and balance

- Assess for the physical factors leading to impairments
- Exercise prescription must be appropriate for the deficits identified and the health profile of the client
- As the level of risk increases and overall health of the client deteriorates, exercise prescription becomes more focused, more time intensive and more tailored to the needs of the client
- As the level of risk increases, a tailored exercise program needs to be part of a multifactorial approach to fall risk reduction
- Exercise prescription must account for safety, and it must specifically challenge balance
- Challenging balance requires decreasing the base of support and decreasing the use of the upper extremities for support
- Progress toward standing exercises as the clients' health profile allows. Seated exercises cannot address standing balance.
- Exercises need to be of sufficient duration and intensity; it has been suggested that 50 hours over 12 weeks is appropriate
- Community and in home exercise have been shown to be effective
- Encourage continued participation in a maintenance exercise program after a formal treatment program has been completed
- Incorporating discussion of behaviour modification into an exercise program helps establish goal setting for continuing engagement in physical activity

## 4D Consider Referral to Health Care Professionals

All health care professionals can be involved with:

- Ensuring that fall prevention is part of standard practice
- Implementation of universal falls precautions in acute care hospitals, continuing care residences, and assisted living facilities
- Understanding the role of other disciplines so that referrals can be made when appropriate
- Education of older adults, caregivers and families on general falls prevention principles. Many falls are preventable, and for those falls that are not, the focus should be on injury reduction strategies. These strategies include protection such as the use of hip protectors, floor cushioning, floor mats, low bed heights, etc
- Understanding that the most effective interventions for the prevention of falls are individualized, often multifactorial and interdisciplinary
- Participating in interdisciplinary fall prevention programs
- Screening for fall risk and assessment of the fall risk factors within their scope of practice
- Interventions within their scope of practice to reduce specific fall risk factors
- Addressing issues related to accessing services/programs such as transportation and cost

Resources for Practitioners:

- [Universal Fall Precautions](#)

## **Dietitians**

Nutrition is of vital importance to all ages. It can be particularly important for older adults as they require fewer calories but not fewer nutrients to maintain their weight and health. Dehydration is common among older adults. This is partly because as we age our sense of thirst diminishes but there are a variety of other factors contributing to this challenge.

Bone health is important for all individuals and particularly those who fall as their risk of fracture is greater. Calcium and Vitamin D intake and requirements should be reviewed, and appropriate levels of supplementation should be prescribed as indicated. (Refer to Section 2B: Check Your Medications)

Refer to a dietitian for assessment and intervention when:

- Body Mass Index (BMI) less than 22 for age 65 years and older
- Unplanned weight loss of > 5% in 1 month or > 10% in 6 months

Other indicators which place clients at Nutrition Risk and require monitoring or community services include:

- Poor appetite
- Changes in dental health or difficulty biting &/chewing.
- Difficulty accessing groceries or making meals related to access, finances or mental health
- Concerns with meal patterns including routine skipping of meals or lack of variety in food intake

Dietitians are available in most Family Health Teams, Community Health Centres, Public health, Home Care Programs, Chronic Disease Management Programs such as Living Well, and some Meals on Wheels Programs, Family physicians can make a referral to Outpatient Dietitian services available in most hospitals.

## **Nurses**

Nurses can play a varied and broad role in fall prevention. In many service areas, it often is the nurse who performs the initial fall risk screen and/or many aspects of a multi-dimensional fall risk assessment (e.g., medical, physical, social, environmental). Nurses' knowledge of medications (side effects, interactions, dosages) may help them to flag medication-specific fall risk factors and trigger them to refer on to a pharmacist, physician, or nurse practitioner for further assessment when appropriate.

Nurses can also support good sleep hygiene, address toileting routines, help create and maintain a safe patient environment in hospital settings, and follow safe patient handling techniques (for safe transfers).

## **Nurse Continence Advisors**

Nurse Continence Advisors (NCA) are Registered Nurses with additional education in assessment and management of continence related issues. Refer to an NCA for:

- Assessment and conservative (non-pharmacological) interventions of lower urinary tract symptoms, especially overactive bladder symptoms or fecal urgency/incontinence which increase risk of falls.
- Conservative treatment of incontinence with diet and fluid management, voiding strategies (e.g. timed voiding), pelvic floor muscle exercises, incontinence pads and devices.
- Pessary fitting
- NCA who are also Nurse Practitioners may also introduce pharmacological strategies (medication changes/dose adjustment, trial of medication for overactive bladder).
- NCAs work primarily in specialty clinics for incontinence, and AHS Health Link can provide further information on referral to the incontinence clinics.

To find an NCA, check the Canadian Continence Foundation website  
<http://www.continence-fdn.ca/english/list-profs/list-profs.php>

## **Occupational Therapists (OT):**

Refer to or consult an OT for:

- Assessment and interventions for safety and independence in Basic Activities of Daily Living (ADL) and Instrumental ADLs (shopping, cleaning, banking etc.)
- Recommendations for transfers (in bathroom, bed, chair and vehicle)
- Environmental assessment and recommendations for modifications and equipment.
- Assessment and prescription of an assistive device (e.g. walking aid, environmental modifications to help with problems in transfers). For those already with an assistive device, evaluation of its appropriateness including determination of whether it is in good repair.
- Advice on the older adults' daily routine to minimize, if not eliminate, high risk activities (e.g., stooping, reaching overhead, climbing up on chairs/ ladders).
- Cognitive and perceptual assessment and interventions.
- Screening for depression (a known falls risk factor) and interventions.
- Awareness of social isolation and interventions to support socialization. This could be group interventions, day programs, or social programs in senior's centres.
- Foot assessment and recommendations for footwear. A referral to an orthotist or podiatrist may be indicated.
- To find an OT, contact the [Ontario Society of Occupational Therapists](http://www.osot.on.ca) at 416-322-3011, Toll Free: 1-877-676-6768 Fax: 416-322-6705  
E-Mail: [osot@osot.on.ca](mailto:osot@osot.on.ca)

## **Pharmacists:**

The role of the pharmacist is primarily focused on medications, but the role is expanding.

- MEDCHECK Program and Structured Medication Reviews: Pharmacists are able to review the medication regimens of patients who are at risk of falling. The high risk medications can be identified and possible alternatives considered. Some pharmacists have prescribing privileges and may be able to change the medications, but in all cases the high risk medications will be

discussed with the original prescriber. A medication review also identifies medications that can be changed or added to improve the management of a condition that is increasing the risk of falling.

- Ambulatory assistive devices: Devices such as canes or crutches are available at many pharmacies. Pharmacists have basic training in fitting and use of these devices.
- Referrals: If a high risk medication cannot be changed the pharmacist can refer the patient to another health professional or program to implement non-pharmacological interventions for falls prevention.
- Education: All health professionals, including pharmacists, are responsible for educating other health professionals and the public regarding medications that are associated with falls in older adults.

### **Physicians**

Family physicians are encouraged to integrate fall prevention into the care they provide older patients. They play a key role in identifying older persons at high risk for falls. They may be comfortable in performing a multifactorial fall risk assessment, initiating interventions targeted at identified fall risk factors, and referring to other health care professionals as needed. If not, they are encouraged to refer older persons at an increased risk of falling to a consultant or service that would be able to deal with this issue. Some family physicians may have a particular interest in falls and may be part of an interdisciplinary fall prevention service.

Family physicians may be called upon for help in particular aspects of the assessment and care provided to older persons at risk of falling such as with the diagnosis and treatment of specific conditions, deciding on the need for further laboratory or radiological investigations, reviewing (and where appropriate altering) medications, or deciding on the need for referrals.

Geriatricians would have additional training and experience in the assessment and management of fall risk in older persons. They could be called upon for assistance, particularly where the clinical challenges are complex. Some have a particular interest in falls and may be part of an interdisciplinary fall prevention service.

A variety of other medical consultants may be called upon to help with the care of an individual patient. Who that might be would depend on the specific issue that needs to be addressed.

### **Physiotherapists:**

Refer to or consult a physiotherapist for:

- Assessment of the physical factors contributing to fall risk factors.
- Some physiotherapists provide detailed assessment and treatment of vestibular function and continence issues.
- Prescription of individualized programs to reduce the physical factors contributing to fall risk, based on assessment findings and client goals.
  - These prescriptions and treatment can encompass but are not limited to:
    - improving balance and gait
    - muscle strengthening
    - improving endurance
    - increasing or maintaining ROM

- reducing pain
- Assessment and prescription of appropriate assistive devices for safe mobility.
- Provision of relevant education concerning reduction of fall risk factors.
- Foot assessment and recommendations for footwear. A referral to an orthotist or podiatrist may be indicated.
- Recommendations for transfers

To find a physiotherapist, click on 'Find a Physiotherapist' at <http://www.opa.on.ca/> or contact the College of Physiotherapists of Ontario 416-591-3828 Toll Free: 1-800-583-5885 Fax: 416-591-3834 email: [info@collegept.org](mailto:info@collegept.org) at [www.collegept.org](http://www.collegept.org)

### **Recreation Therapists**

Recreation therapy acknowledges the significance of leisure and recreation as integral components of optimal health and well-being for individuals.

Refer to a recreation therapist to:

- Assess and provide leisure needs and abilities to promote an active lifestyle.
- Provide advice on how to build activities into daily routine and what resources are available to individuals in the community.
- For more information on recreation therapy or if there is no recreation therapist in your setting, contact the [Therapeutic Recreation of Ontario](#)

### **Social Workers**

- Social workers can address the psychosocial aspects of fall risk factors, which are primarily those related to anxiety and/or depression. Social Workers can provide assessment and counselling for fear of falling. A social worker can offer helpful strategies and provide resources to minimize or limit fear of falling .For more information see Section 4F.
- Social workers can facilitate the access and purchase of emergency response systems, home modifications, hip protectors, and safe housing options. They can also assist those who struggle with the problem of hoarding or cluttered environments accessing community resources and programs.
- Within the Ontario Hospital Association and the LHIN system or facilities, one may find a social worker by contacting a hospital department of social work or department of mental health. Outside of these facilities, one may have to contact Canadian Mental Health Association (CMHA) or their local mental health services via 211Ontario, 310-CCAC (2222) or a family physician.

### **Specialized Services**

- Referral to a specialized falls clinic should be considered if further expertise is needed to determine falls risks or appropriate interventions.
- Refer to [211 Ontario](#) or [Finding Balance Ontario](#) websites for areas where Falls Clinics are available
- Refer to specialized geriatric programs if no specialized falls clinic is available in your area.

## Other Health Care Professionals

Depending on the assessment findings, referrals to other healthcare professionals such as podiatrists, orthotists, etc. may be appropriate.

## 4E Environmental Modifications

- Recommendations to address home hazards are effective for older adults with a history of falls and mobility limitations, especially when combined with other strategies.
- Checklists and education alone on modifications have only modest effects.
- Providing/ordering items with follow-up to make sure equipment is being used correctly is recommended.
- When walking outdoors in winter footwear with a good grip and the use of removable lightweight traction devices for shoes and ice picks on canes can minimize the risk of slipping.
- For older adults living alone, an emergency response system should be considered.
- If you are involved with the planning and construction of new facilities, consider information on senior-friendly hospitals, barrier-free design, age-friendly cities and age-friendly communities.
- Following a hip fracture, it is important to assess the home environment in addition to providing whatever equipment is required to ensure hip precautions are followed.

Resources for Practitioners:

- [Designing against falls: The impact of the built environment on older adult falls](#)
- [Global age-friendly cities: A guide](#)
- [Checklist of essential features of age-friendly cities](#)
- [Unit Standard Protocol Fall Prevention Protocol](#)
- [Universal Fall Precautions](#)

Examples of Resources for Clients:

- [Check for Safety - A Home Fall Prevention Checklist for Older Adults](#)
- [Be Falls Smart in Your Home](#)
- [Be Falls Smart in Your Community](#)
- [Be Falls Smart in what you do - Footcare and Footwear](#)
- [Ideal Shoe](#)
- [Safety Tips for Winter Walking](#)
- Grab bars to assist with car transfers, sold at various medical supply stores

## 4F Fear of Falling

- Fear of falling has been frequently cited as one of the most incapacitating psychological consequences of falls in older people because it often leads to activity restriction and increased dependence on others. Rather than reduce an older person's fall risk, a fear of falling can contribute to their risk.
- Fear of falling is a potential consequence of experiencing a fall; however it can also be reported by those who have never fallen.
- Fear of falling becomes problematic when it is immobilizing for the client who begins to limit their activities due to fear. When fear creates debilitating anxiety and distracts focus from or interferes with an activity then it is important to further assess.

- One of the most researched and frequently used tools to assess fear of falling in older adults is the Falls Efficacy Scale (FES) which measures a person's confidence (on a 10 point scale) in performing certain ADLs and IADLs without falling.
- For screening purposes, you may want to ask the following:
  1. Are you afraid of falling?
  2. How afraid are you that you will fall and hurt yourself in the next year (1= not afraid at all; 4= very afraid)?
  3. Are there things you don't do because you might fall?
  4. Are there things you have stopped doing because you are worried you might fall?
- It can also be helpful to determine if there are certain locations where the person is afraid of falling e.g. outdoors, on stairs etc.
- Programs targeted at improving physical skills through physical activity/exercise and confidence may assist with improving a person's sense of fear of falling.
- Fear of falling can adversely affect physical, mental and social functioning of older adults. Counseling from has shown to be effective in treating fear of falling.
- Fear of falling can be associated with depression. Older adults with marked fear of falling should be screened for depression using an instrument such as the Geriatric Depression Scale.
- Fear of falling is most often associated with anxiety. A screen used in the Calgary Fall Prevention Clinic to screen for anxiety is the SAST (Short Anxiety Screening Tool). It was developed as a brief means of identifying older adults with anxiety problems, especially in the presence of depressive symptoms.
- The Falls Efficacy Scale – International (FES-I) has been developed by the Prevention of Falls Network Europe. There is a validated 16 item version and a 7 item version both including a social dimension. These accurately predicts falls. They are validated with those who have moderate cognitive impairment.
- Some Falls Prevention Clinics or Programs make a referral to Social Work if, on assessment, any of the following are evident:
  1. Fear of falling interferes with Basic ADLs and/or Instrumental ADLs,
  2. Compromises quality of life (severely limits ability to participate in previously enjoyed activities, or limits social contact), or
  3. Interferes with good judgment or preoccupies the person's thoughts.

Resources for Practitioners:

- [Falls Efficacy Scale](#)
- <http://www.profane.eu.org> Access this website for the FES-I and its translated versions
- SAST

#### **4G Falls and Cognition**

- Age-associated changes in cognition can adversely affect balance and mobility. As part of the assessment of an older person for fall risks it is recommended that a standardized brief cognitive test be administered. There is no evidence to advocate for one test over another at this time.
- An estimated 10% of people over the age of 65 and 50% of those over the age of 80 have some form of cognitive impairment, ranging from mild deficits to dementia.
- Even mild forms of impaired cognition can be associated with an increased risk of falls among older persons. For example, a study of community-dwelling seniors at risk of falling found that the likelihood of falls increased incrementally as Mini-Mental State

Examination scores declined from 30 to 22. Subtle cognitive deficits might increase the risk of falling because of impairments in judgment, attention, or executive function.

- People with dementia have 2-3 times the risk of falling. Well-known risk factors such as motor impairments show particular characteristics in those with dementia. For example, balance, lower extremity coordination, walking speed, and stride length are adversely affected in those with dementia.
- Behavioural disturbances (e.g. risk-taking behaviour) contribute to a higher risk for falling in this population. As well, there is a higher prevalence of many other risk factors in those with dementia, including the use of psychotropic medication, orthostatic hypotension/syncope, and lower activity levels.
- Clients with dementia are often unable to comply with risk factor management strategies. Assessment therefore must identify all possible risk factors for falls, including biological, behavioural, social-economic and environmental factors. The latter are important to understand as circumstances surrounding falls can explain some of the variation in falls among those clients with dementia.
- There is some evidence that physical activity provides a protective role in lowering the risk of cognitive impairment and dementia - in particular resistance training. A side benefit is resistance training specifically moderates the development of sarcopenia. Increased muscle strength has shown to lead to decreased falls and decreased fracture risk.
- As not all falls can be prevented, strategies for injury reduction must be considered. Examples include the use of protective equipment such as hip protectors, cushioned floor surfaces, bed or chair alarms, bedside mats, and raised mattress edges. Other strategies are low beds positioned against the wall, avoidance of the use of restraints, calming rooms, music, regular toileting and commodes/bottles for night which may reduce the risk of injury.

#### **4H Falls Prevention Education**

- When communicating with the older adult, it is important to use plain language. Plain language is text that is easy and quick to read. It is intended for a broad group of people some of whom may not have high literacy and clarifies and explains information to non-medical professionals. It is not 'dumbing' down professional writing or underrating the complexities of medical care.
- Reading level of materials should be at a grade 4-6 level. If providing written information, dark lettering on a light background with large font size (14) is recommended.
- Brochures on falls prevention, bone health, diet, activity and other topics should be provided as appropriate.
- Consider adult learning principles such as:
  1. Information needs to relate to the seniors' own experience and make sense to them.
  2. Adults must actively participate in the learning experience to remember it.
  3. Everyone learns at different rates and in different ways
- Educate older adults and their families that most falls are preventable and for those falls that are not preventable, educate on injury reduction strategies.
- Research indicates that the language used with older adults can influence the uptake of information. Messages are better received if they are positive and focus on healthy aging, mobility and independence rather than falls and safety. Refer to the article, "Don't Mention the 'F' Word" for more details.

Examples of Resources for Clients:

- [Take Action: Prevent a fall before it happens](#)
- [A Million Messages for Seniors' Falls Prevention](#)

### Behaviour Change

- Most of the recommendations provided to older adults require a change in their behaviour. To be motivated to change behaviour, the older person must:
  1. Believe that there is a problem
  2. Believe that it is their problem
  3. Believe that there is a solution
  4. Believe that they can implement it and receive benefits
- Individuals have to be ready to change. Prochaska outlines six stages in his Transtheoretical Model of Stages of Readiness for Change (precontemplation, contemplation, preparation, action, maintenance, and termination). It is important for the clinician to recognize the stage the client is at as different approaches are necessary to engage individuals at different stages.
- Motivational interviewing is a tool for facilitating many different kinds of positive behaviour change. The basis for it is guiding individuals to evoke their own motivations for change. It has been defined as *"... a client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence."*
- To facilitate behaviour change, consider programs that emphasize social aspects and counter the belief that nothing can be done. Find out what the clients are willing to modify and address their concerns first. Fear of falling, activity avoidance and lack of ability may need to be addressed first.
- Older adults are not a homogeneous group and will have differences in how they accept falls prevention strategies depending on their age, level of frailty, socioeconomic status and culture. One size does not fit all. When planning education or any interventions, the targeted group must be considered.

Resources for Practitioners:

- [Motivational Interviewing](#)
- Stages of Change

### 4I Instructions for "How to Get up From a Fall"

Older adults are often unsure of how to get up from a fall. Information on [how to safely get up](#) or [how to safely help someone else get up](#) have been translated into multiple languages and may be downloaded from the Finding Balance website. Have the client practice this in your presence whenever possible.

## **Bibliography:**

Alberta Centre for Injury Control & Research. (2009). *Seniors' Falls Injuries in Alberta*. Edmonton, AB: Alberta Centre for Injury Control & Research.

Apollo. (2008). *A guide for implementers of interventions to prevent falls in community-dwelling older people*. Retrieved March 4, 2010, from [http://www.childsafetyeurope.org/csi/eurosafe2006.nsf/0/D87464685E9DFA75C125754D0030BE96/\\$file/A%20guide%20for%20implementers%20of%20interventions%20to%20prevent%20Ofalls...pdf](http://www.childsafetyeurope.org/csi/eurosafe2006.nsf/0/D87464685E9DFA75C125754D0030BE96/$file/A%20guide%20for%20implementers%20of%20interventions%20to%20prevent%20Ofalls...pdf).

Apollo WP4. (2009). *Feasibility of large scale interventions for preventing falls among older people in the European Union*. Retrieved March 4, 2010, from [http://www.marionegri.it/mn/it/docs/sezioni/dipartimenti/epidemiol/metodiEpidemiologici/Apollo\\_WP4\\_D4-1.pdf](http://www.marionegri.it/mn/it/docs/sezioni/dipartimenti/epidemiol/metodiEpidemiologici/Apollo_WP4_D4-1.pdf).

Apollo WP4. (2009). *Prevention of fall in older people: Time to act*. Retrieved March 5, 2010, from [http://www.marionegri.it/mn/it/docs/sezioni/dipartimenti/epidemiol/metodiEpidemiologici/Apollo\\_WP4\\_D4-3.pdf](http://www.marionegri.it/mn/it/docs/sezioni/dipartimenti/epidemiol/metodiEpidemiologici/Apollo_WP4_D4-3.pdf).

Avenell A., Gillespie W.J., Gillespie L.D. & O'Connell D.L. (2005). Vitamin D and vitamin D analogues for preventing fractures associated with involutional and post-menopausal osteoporosis. *Cochrane Database Syst Rev*, Jul 20(3), CD000227.

Aspland R. (2005). Nocturia in relation to sleep, health, and medical treatment in the elderly. *BJU International*, 96 (Suppl. 1), 15-21.

BMJ 2010;340:c2265. Effect on falls of providing single lens distance vision glasses to multifocal glasses wearers: VISIBLE randomised controlled trial  
Add Berg balance Scale if we find reference

Basra, R., Artibani, W, Cardozo, L., Castro-Diaz, D., Chapple, C., Cortes, E. et al., (2007). Design and Validation of a New Screening Instrument for Lower Urinary Tract Dysfunction: The Bladder Control Self-Assessment Questionnaire (B-SAQ). *European Urology* 52, 230–238.

Bischoff-Ferrari H.A., Dawson-Hughes B., Willett W.C., Staehelin H.B., Bazemore M.B., Zee R.Y. & Wong J.B. (2004). Effect of Vitamin D on falls: a meta-analysis. *JAMA*, 291(16), 1999-2006.

Campbell J.A., Robertson M.C., Gardner M.M., Norton R.N. & Buchner D.M. (1999). Psychotropic medication withdrawal and home-based exercise program to prevent falls: a randomized, controlled trial. *J Am Geriatr Soc*, 47, 850-3.

Campbell J.A., Robertson M.C., La Grow S.J., Kerse N.M., Sanderson G.F., Jacobs R.J., Sharp D.M. & Hale L.A. (2005). Randomised controlled trial of prevention of falls in people aged >75 with severe visual impairment: the VIP trial *BMJ*, 331, 817-24.

Ceglia L. (2008). Vitamin D and skeletal muscle tissue and function. *Mol Aspects Med*, Aug 8.

Chaiwanichsiri D, Janchai S, Tantisiriwat N: Foot disorders and falls in older persons. *Gerontology* 2009, 55:296-302.

Chang J.T. & Ganz David A. (2007). Quality Indicators for Falls and Mobility Problems in Vulnerable Elders. *J Am Geriatr Soc*, 55 (Supplement 2), S327-334.

Cumming R.G., Thomas M., Szonyi G., et al. (1999). Home visits by an occupational therapist for assessment and modification of environmental hazards: a randomized trial of falls prevention. *J Am Geriatr Soc*, 47, 1397-1402.

Dam T.T., von Mühlen D. & Barrett-Connor E.L. (2008). Sex-specific association of serum vitamin D levels with physical function in older adults. *Osteoporos Int*, Sept 19.

Dros J, Maarsingh OR, van der Horst H, Bindels PJ, ter Riet G, van Weert HC: Tests used to evaluate dizziness in primary care. *CMAJ* 2010. DOI:10.1503/cmaj.080910.

Ganz D.A., Bao Y., Shekelle P.G. & Rubenstein L.Z. (2007). Will My Patient Fall? *JAMA*, 297:77-86.

Gleason CE, Gangnon RE, Fischer BL, Mahoney JE: Increased Risk of Falling Associated with Subtle Cognitive Impairment: Secondary Analysis of a Randomized Clinical Trial. *Dement Geriatr Cogn Disord* 2009, 27:557-63.

Harlein J., Halfens R.J.G. & Heinze C. (May 2009). Fall risk factors in older people with dementia or cognitive impairment: a systemic review. *Journal of Advanced Nursing*, 65 (5), 922-33.

Hartikainen S., Lönnroos E. & Louhivuori K. (2007). Medication as a Risk Factor for Falls: Critical Systematic Review. *J Gerontol A Biol Sci Med Sci*, 62(10), 1172-1181.

Harwood R.H., Foss A.G.E., Osborn F., Gregson R.M., Zaman A. & Masud T. (2005). Falls and health status in elderly women following first eye cataract surgery: a randomised controlled trial. *Br J Ophthalmol*, 89, 53-59.

Health Canada Osteoporosis reference  
[http://www.osteoporosis.ca/index.php/ci\\_id/5535/la\\_id/1.htm](http://www.osteoporosis.ca/index.php/ci_id/5535/la_id/1.htm)

Hogan D.B. & Marilyn Kwan M. (2002). Drug Use in the Elderly. Retrieved March 15, 2010, from <https://pharmacists.ab.ca/downloads/documentloader.ashx?id=2123>.

Howland J., Peterson E.W., Levin W.C., Fried L., Porden D. & Bak S. (1993). Fear of falling among the community-dwelling elderly. *Journal of Aging and Health*, 5, 229-243.

Jackson C., Gaugris S., Sen S.S. & Hosking D. (2007). The effect of cholecalciferol (vitamin D3) on the risk of fall and fracture: a meta-analysis. *QJM*, 100, 185–192.

Kelsey JL, Procter-Gray E, Nguyen UDT, Li W, Kiel DP, Hannan MT: Footwear and falls in the home among older individuals in the MOBILIZE Boston Study. *Footwear Science* 2010, 2:123-29.

- Lachman M., Howland J., Tennstedt S., Jette A., Assman S. & Peterson E. (1998). Fear of falling and activity restriction: The survey of activities and fear of falling in the elderly (SAFE). *Journal of Gerontology*, 53B(1), 43-50.
- Lahat M. & Muller M. (2009). Striving for safety: initiative for home care clients with dementia. *Caring*, 28(8), 28 -31.
- Liu-Ambrose T. & Donaldson M.G. (2009). Exercise and cognition in older adults: is there a role for resistance training programmes? *Br J Sports Med*, 43, 25-27.
- Mathias S., Nayak U.S. & Isaacs B. (1986). Balance in elderly patients: the 'get up and go' test. *Arch Phys Med Rehabil*, 67: 387-89.
- McKiernan F.E. (2005). A Simple Gait-Stabilizing Device Reduces Outdoor Falls and Nonserious Injurious Falls in Fall-Prone Older People During the Winter. *J Am Geriatr Soc*, 53 (4), 943-47.
- di Monaco M., Vallero F., de Toma E., de Lauso L., Tappero R. & Cavanna A. (2008). A single home visit by an occupational therapist reduces the risk of falling after hip fracture in elderly women: A quasi-randomized controlled trial *J Rehabil Med*, 40, 446-50.
- Menant JC, Steele JR, Menz HB, Munro BJ, Lord SR: Optimizing footwear for older people at risk of falls. *Journal of Rehabilitation Research and Development* 2008, 45:1167-82.
- Menz HB, Lord SR: The contribution of foot problems to mobility impairment and falls in community-dwelling older people. *J Am Geriatr Soc* 2001, 49:1651-6.
- Morse, J.M., Morse, R.M., & Tylko, S.J. (1989). Development of a scale to identify the fall-prone patient. *Canadian Journal on Aging*, 8,366-377
- National Institute for Health and Clinical Excellence. (2004). *Clinical Practice Guidelines for the Assessment and Prevention of Falls in Older People*. Retrieved March 8, 2010, from <http://www.nice.org.uk/nicemedia/pdf/CG021fullguideline.pdf>.
- Nordin E., Lindelöf N., Rosendahl E., Jensen J. & Lundin-olsson L. (2008). Prognostic validity of the Timed Up-and-Go test, a modified Get-Up-and-Go test, staff's global judgement and fall history in evaluating fall risk in residential care facilities. *Age and Ageing*, 37, 442-448.
- Parker M.J., Gillespie W.J. & Gillespie L.D. (2005). Hip protectors for preventing hip fractures in older people. *Cochrane Dataase Syst Rev* Jul 20(3), CD001255.
- Parker M.J., Gillespie W.J. & Gillespie L.D. (2006). Effectiveness of hip protectors for preventing hip fractures in elderly people: systematic review. *BMJ*, 332, 571-4.
- Peel N., Steinberg M., Williams G. (2000). Home safety assessment in the prevention of falls among older people. *Australian and New Zealand Journal of Public Health*, 24, 536-39.
- Podsiadlo D. & Richardson S. (1991). The timed 'Up & Go': a test of basic functional mobility for frail elderly persons. *J Am Geriatr Soc*, 39, 142-48.
- Post RE, Dickerson LM: Dizziness: A Diagnostic Approach. *Am Fam Phys* 2010, 82:361-68.

Prevention of osteoporosis-related fractures among postmenopausal women and older men. *CMAJ* 2009; 181(11):815-820

Prochaska, T.O., James, O. & Norcross, J.C. (2001). Stages of Change. *Psychology*, 38 (4), 443-8.

Rixt Z.G.A., van Haastregt J.C.M., van Rossum E., van Eijk J.T.M., Yardley L. & Kempem G.I.J.M. (2007). Interventions to Reduce Fear of Falling in Community-Living Older People: A Systematic Review. *J Am Geriatr Soc*, 55(4), 603-615.

Rose D. (2010). *Fall Proof!* Windsor, ON: Human Kinetics.

Scheffer A.C., Schuurmans M.J., van Dijk N., van der Hooft T. & de Rooij S.E. (2008). Fear of falling: Measurement Strategy, Prevalence, Risk Factors and Consequences among Older Persons. *Age Ageing*, 37, 19-24.

Scott V., Lockhart S., Gallagher E., Smith D., Asselin G., Belton K. & Duncan B. (2007). *Canadian Falls Prevention Curriculum*. Vancouver, BC: BC Injury Research & Prevention Unit.

Shumway-Cook A., Brauer S. & Woollacott M. (2000). Predicting the Probability for Falls in Community-Dwelling Older Adults Using the Timed Up & Go Test. *Phys Ther*, 80, 896-903.

Steffen T.M., Hacker T.A. & Mollinger L. (2002). Age-and gender-related test performance in community-dwelling elderly people: six-minute walk test, Berg balance scale, timed up & go test, and gait speeds. *Phys Ther*, 82, 128-37.

Tinetti M. (2003). Preventing Falls in Elderly Patients. *The New England Journal of Medicine*, 348, 42-49.

Tinetti M., Mendes L., Doucette J. & Baker D. (1994). Fear of falling and fall-related efficacy in relationship to functioning among community-living elders. *Journal of Gerontology*, 49(3).

Tideiksaar R. (1998). *Falls in Older Persons - Prevention and Management*. Second Edition. Baltimore. Health Professions Press.

Todd C, Skelton D. (2004) *What are the main risk factors for falls among older people and what are the most effective interventions to prevent these falls?* Copenhagen, WHO Regional Office for Europe (Health Evidence Network report; <http://www.euro.who.int/document/E82552.pdf>, accessed 2 February 2011).

van der Velde N., Stricker B.H.C., Pols H.A.P. & van der Cammen T.J.M. (2007). Risk of falls after withdrawal of fall-risk-increasing drugs: a prospective cohort study. *British Journal of Clinical Pharmacology*, 63(2), 232-237.

Weatheral M. & Arnold T. (2006). Nocturia in adults: draft New Zealand guidelines for its assessment and management in primary care. *Journal of the New Zealand Medical Association*, 119(1234).

Wenger, Neil S., Roth C.P. & Shekelle, P. (2007). Introduction to the Assessing Care of Vulnerable Elders-3 Quality Indicator Measurement Set. *Journal of the American Geriatrics Society*, 55 (Supplement 2), S247-S252.

Wyman J.F., Croghan C.F., Nachreiner N.M., Gross C.R., Stock H.H., Talley K. & Monigold M. (2007). Effectiveness of education and individualized counseling in reducing environmental hazards in the homes of community-dwelling older women. *J Am Geriatr Soc*, 55, 1548-56.

Yaffe K., Barnes D., Nevitt M., Lui L.Y. & Covinski K. (2001). A Prospective Study of Physical Activity and Cognitive Decline in Elderly Women: Women who Walk. *Archives of Internal Medicine*, 161, 1703-1708.

Yardley L, Donovan-Hall M, Smith HE, Walsh BM, Mullee M, Bronstein AM: Effectiveness of Primary Care-Based Vestibular Rehabilitation for Chronic Dizziness. *Ann Intern Med* 2004, 141:598-605.

## **Acknowledgements:**

The development of this algorithm has been a true collaboration of passionate, dedicated individuals working in the area of seniors' falls prevention. We would like to acknowledge the work of Dr. Dave Hogan on which this algorithm is based.

This algorithm is meant to be dynamic in that it will continually be updated as new research, best practice and new resources are completed. There are links throughout it to practitioner tools and resources for clients. We welcome your feedback on the algorithm and hope it will be useful in your assessment and management of seniors' falls.

Ontario Finding Balance and members of the South West Regional Falls Prevention Network acknowledge the work that Dr. Dave Hogan, ACICR, and Finding Balance Alberta have contributed and continue to contribute to this Algorithm and the many other resources that they have kindly made available.