Appendix B: Categories of Assessment for Patients Evaluated at Fall and Injury Risk (with suggested management)

History

1. Fall history

- Circumstances of the fall(s) (e.g., date, location, and time of falls, what the patient was doing at the time of a fall, belief as to the cause, witnessed details, mobility aid, use of medical alert device)
- Associated symptoms preceding and after the fall (e.g., palpitations, loss of consciousness, headache, nausea). NOTE: patients with loss of consciousness will require a syncope assessment
- Frequency of falls
- Details of any fall-related physical and/or psychological injuries
- Severity and duration of any changes in ADLs/mobility status and in client's confidence walking/fear of falling
- Post-fall interventions

History: Functional Review

2. Physical activity and endurance (e.g., how far they can walk)

- Assess patient readiness and fitness for physical activity (fall risk, injury risk, cardiac risk, etc.)
- Activity level/endurance and strength
- Exercise program including strength and balance exercises
- Fatigue and energy level

Suggested management:

- Refer to a community or home exersice program (see: Exercise Prescription and Programs) that focuses on balance and strength, suits individual patient level and includes appropriate increases in intensity. Consider falls history, frailty/functional abilities, current exercise level, review of medical comorbidities (including cognitive status) and motivational level. Review barriers to exercise such as transportation.
- In BC, this includes programs like Osteofit (including Get Up & Go!); Physical Activity Services (offered through HealthLink BC/8-1-1); an Otago-based program class; Tai Chi; SAIL (Strategies and Actions for Independent Living) and SAIL-FN (Strategies and Actions for Independent Living for First Nations).
- If pain and balance issues impair suitability for a group exercise program, consider referral to a physiotherapist and/or a qualified kinesiologist.
- Refer individuals with a gait and balance impairment to a physiotherapist and/or a qualified Kinesiologist, for balance and gait training (see the Mobility section for standardized tests recommended to assess balance and gait).
- Manage and/or refer any medical causes of impaired gait. See Appendix A: Medical Conditions Associated with Gait and Balance Disorders for Medical Conditions Associated with Gait and Balance Disorders.
- Encourage use of an alert device to provide support:
  - Consider other technology in the home: Philips Lifeline, SafeTracks GPS Canada, SafeGuard Medical Alert, Telus LivingWell Companion, Apple Watch Series 4 or 5 (has a falls sensor to detect falls, which will automatically call for help if set up and linked to a phone)
- Equipment with correct fit may be recommended by physiotherapy and/or occupational therapist to prevent falls and injury (see Choosing the correct walking aid for patients).
- If history suggests patient may be subject to recurrent falls, consider:
  - Hip protectors (see fraserhealth.ca: Hip protectors, Interiorhealth.ca: Hip protectors work!)
  - Helmets and/or head protection for those with a history of falls

3. **Identify limitations in ADLs** (for example: mobility, nutrition, lifts and transfers, bathing, dressing, grooming and toileting)

Suggested management:

- Consider referral for occupational therapy, home care support, social work, etc. available through Home and Community Care at local health authorities.
- Review safe transportation, driving skills as appropriate.

4. **Access and use of adaptive equipment**
    - Evaluate if and how the patient uses adaptive equipment and/or mobility aids

History: Medical Review

5. **Co-morbidities and risk factors**
    - See Appendix A: Medical Conditions Associated with Gait and Balance Disorders for a list of medical conditions that cause gait and balance problems and Table 1 for risk factors

Suggested management:

- Optimize treatment of comorbidities identified. Some comorbidities have associated guidelines at BCGuidelines.ca:
    - *Frailty in Older Adults – Early Identification and Management*
    - *Major Depressive Disorder in Adults*
    - *Stroke and Transient Ischemic Attack*
    - *Diabetes Care*
    - *Cardiovascular Disease*
    - *Hypertension*
    - *Cognitive Impairment*
    - *Osteoporosis* (increases risk of fracture from fall)

6. **Medication review**
    - See Appendix C: Medications Contributing to the Risk of Falling for a list of medications that increase risk of falling or serious outcomes if a fall incident occurs
    - For information and resources on conducting a medication review, see Appendix D: Conducting a Medication Review, Beers Criteria or deprescribing.org
    - Request a medication review by a trained pharmacist which is covered by BC Pharmacare for eligible patients

Suggested management:

- Consider withdrawing or minimizing use of psychoactive medication(s), cardiovascular medication(s), sedative(s) or medication(s) with anti-cholinergic side effects.
- **Educate patients on increased risk of hemorrhage with anticoagulant and antiplatelet use.** Advise to watch for new symptoms if they fall. Anticoagulants and antiplatelets (e.g., warfarin, NOACs, ASA and other antiplatelet agents) increase the risk of bleeding from an injury from a fall, however, may still be indicated based on individualized risk assessment.[60–62] A detailed discussion of anticoagulants for the person at risk is beyond the scope of this guideline and individualized discussion with the patient is warranted. For more information, see the associated BC Guideline: *Use of NOAC in Non-Valvular Atrial Fibrillation* and BC Guideline: *Warfarin Therapy Management*.
- Certain drugs (proton pump inhibitors [PPI], corticosteroids, etc.) may increase the risk of fracture during a fall and review of PPI use is warranted.[60,63] For more information, see the associated BC Guideline: *Osteoporosis: Diagnosis, Treatment and Fracture Prevention*.

7. Nutrition and hydration

- Assess volume intake and loss (e.g., diarrhea, vomiting, fluid restriction), diet/appetite, weight loss, dentition, swallowing, obesity

Suggested management:

- Consider a nutrition supplement
- Direct patient to dietitian services offered through HealthLinkBC.ca or 8-1-1 or local health unit or hospital outpatient services. Consider referral to a speech language pathologist, dentist, or denturist as appropriate

8. Continence/rushing to the bathroom

- Assess urinary and bowel continence and causes (e.g., Benign Prostatic Hyperplasia)

Suggested management:

- Review medications that may contribute to bowel/bladder urgency (e.g., diuretics, laxatives, etc). For additional details on medications that contribute to fall risk see Appendix C: Medications Contributing to the Risk of Falling
- Consider adding a bowel protocol
- Consider referral to a Nurse Continence Advisor, where available (e.g., Fraser Health, Providence)

9. Vitamin D intake

- Recommend Vitamin D supplementation

Suggested management:

- Vitamin D supplementation is recommended in northern hemispheres. It is not effective for fall and fracture prevention but can promote muscle strength
- For specific recommendations on Vitamin D and for patients at risk of osteoporosis, see the associated guidelines at BC Guideline: *Vitamin D Testing* and BC Guideline: *Osteoporosis*

History: Social and environmental review

10. Substance use

- Review of substance use, including alcohol, cannabis use and illicit drug use

Suggested management:

- For further information on alcohol consumption, see the BC Guideline: *Problem Drinking* or the *Canadian Low Risk Drinking Guidelines*

11. Environmental and home hazards

- Ask about potential home hazards (stairs, lack of handrails or grab bars, poor lighting, slippery or uneven surfaces [e.g., throw rugs, tub floor], obstacles and tripping hazards)
- Consider seasonal hazards

Suggested management:

- Refer to an occupational therapist for a home assessment and environmental modification
- Consider directing patient to access help at home through BetteratHome.ca
- For further information on environmental hazards see *Associated Document: Checklist of Preventing Falls at Home* and *Patient Handout: Tips to Stay Fall Free in Winter*

12. Living alone and social isolation

- Both of these factors increase falls risk. Community referrals/social prescribing using services to promote health and wellbeing and reduce social isolation are important interventions.[64]

Physical exam: Functional review

13. Mobility

- Evaluate gait, strength and balance
- One or both of the following short standardized tests is recommended to assess balance and gait[25,47–49,65,66] Conducting more than one mobility or balance screening test will enhance specificity and sensivitity[48]
  - **30 Second Chair Stand Test (optional)** - see *Associated Document: Chair Stand Test* for instructions. The 30 Second Chair Stand Test, also known as the "30 Second Sit to Stand Test", assesses lower extremity strength, and is quick and easy to administer in the clinical setting.
  - **Four Stage Balance Test (optional)** - see *Associated Document: Four Stage Balance Test* for instructions. The Four Stage Balance Test assesses static balance and is quick and easy to administer in the clinical setting.

14. Feet and footwear

- Ankle flexibility, plantar tactile sensitivity, toe plantar/flexor strength, moderate to severe bunion, toe deformity, ulcer, and/or deformed toenail have all been associated with falls[67]
- Proper footwear is important for fall prevention (e.g., shoe fit, traction, insoles, heel height)

Suggested management:

- Treat identified foot problems or refer to a podiatrist and/or pedorthist and/or orthopedics specialist

Physical Exam: Medical Review

15. Visual acuity

- Common assessment tool (Snellen eye test)
- Encourage annual eye examinations
- Assess for use of multifocal lenses (multifocal lenses are not recommended). Patients wearing multifocal glasses may have added risk for falls due to impaired distance contrast sensitivity and depth perception.
- For those with cataracts, expedited surgery on the first affected eye is shown to significantly reduce fall risk. See *BCGuidelines.ca: Cataract – Treatment in Adults*

Suggested management:

- Refer to an ophthalmologist or optometrist for vision assessment and correction
- Stop, switch, or reduce the dose of medication affecting vision (e.g., anticholinergics)

16. Orthostatic/postural hypotension

- For best results, measure blood pressure and pulse rate after patient has been lying for 5 minutes and again after patient standing for one minute.[68] For further information, see Measuring Orthostatic Blood Pressure.
  - A decrease in standing blood pressure of greater than 20mm Hg indicates an increased risk for falling when standing up.

Suggested management:

- Treat reversible causes, stop, switch, or reduce the dose of medications that contribute to hypotension
- Educate about importance of exercises (e.g., foot pumps)
- Review need for adequate hydration
- Consider compression stockings

17. Other system examination

- Evaluate patient for new diagnosis or diagnoses that may contribute to fall risk:
  - Cardiovascular examination: orthostatic vitals, arrhythmia, murmurs and bruits
  - Neurological examination: sensory, pyramidal, cerebellar, extrapyramidal, peripheral neuropathy, spinal stenosis, radiculopathy
  - Sensory examination
  - Joint and muscle examination (including kyphosis)
  - Leg length measurements
  - Cognitive screen
  - Depression screen

Reference: Materials for Healthcare Providers | STEADI - Older Adult Fall Prevention | CDC Injury Center [Internet]. 2019 [cited 2020 Feb 21]. Available from: https://www.cdc.gov/steadi/materials.html