



Community-Based Falls Prevention

How Chiropractors Can Help Reduce the Risk in Canada's Aging Population

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As Canada's population ages, there is a growing concern about falls, especially for those already weakened by one of the chronic diseases prevalent in seniors. The effects of a fall can be devastating including fracture, traumatic brain injury, and spinal cord injury.¹ Chiropractors are well-positioned to actively screen and assist in the implementation of strategies to mitigate falls risk in community-based patients. Chiropractic expertise in understanding and treating musculoskeletal (MSK) conditions and chronic disease associated with aging has led to increased participation in interprofessional teams focused on falls prevention.

As participants in the multidisciplinary team at the Centre for Family Medicine Family Health Team Mobility Clinic in Kitchener, Ontario, we have experience in collaboration aimed to reduce the risk of falls for community-based patients and will present some of the tools used to help assess patients for falls risk.

According to the guidelines² on falls prevention published by the American Geriatrics Society (AGS) and British Geriatrics Society (BGS), all patients over age 65, or those with a predisposing medical condition, should be asked annually if they have fallen in the last year. If two or more falls have occurred, the patient should be referred to their primary care physician for a multifactorial falls risk assessment. If the patient has had one fall in the last year, they should be evaluated for balance and gait, and referred for a multifactorial falls risk assessment if any concerns are discovered. Unfortunately, multifactorial falls risk assessment is not available in all communities. Other professionals, including chiropractors, may need to help fill this gap.

ASSESSING FALLS RISK: A GUIDE FOR CHIROPRACTORS

PATIENT HISTORY AND MEDICAL EVALUATION

A proper history is essential for assessing falls risk. A full medical history should be taken to determine the presence of any predisposing acute or chronic conditions. A fear of falling has been shown to put a patient at even greater risk of falling. The Activities-Specific Balance and Confidence (ABC) Scale questionnaire can assess this level of fear. For those who have fallen there is the risk of developing post-fall anxiety syndrome.

Chiropractors assessing a patient who has fallen need to note the following Red and Yellow Flags and additional information that should be brought to the attention of the patient's primary care physician.

See table 1.1. on page 14.

PHYSICAL EXAMINATION

There is no gold standard in a physical examination for falls risk assessment. A full MSK examination of the upper and lower extremities and cervical and lumbar spine should occur including an orthopaedic and neurological assessment (cranial nerves, cognition, motor, sensory, reflexes, coordination).

TESTING FOR FALLS RISK

Here is a list of popular, effective tools used to measure falls risk in older people. It is important to remember to be prepared to catch the subject during any balance testing. You need not be a gait expert to assess fall risk in gait — a subject who nearly falls, wall- or furniture-walks (reaches for objects to maintain balance) or limps during any testing is at a higher risk of falls.

Timed "Up and Go" (TUG) Test:

This test is used to assess mobility, balance, walking ability, and fall risk in older adults. In this test, the subject starts by sitting in an arm chair and is then asked to rise, walk to a line three metres away (10 feet), turn around, come back, and sit down. The subject performs one practice trial, and then completes the test three times. The average of the time it takes to complete each of the three tests is used to determine falls risk. There is great variance in the recommended cut-off times for falls risk, but some experts believe a time of greater than 13.5 seconds indicates a high risk of falls.

NeuroLogic Examination Videos: The University of Utah has an excellent library of videos to help evaluate abnormal gait including video comparisons of demonstrations versus abnormal exam findings. These include Hemiplegic Gait, Diplegic Gait, Neuropathic Gait, Myopathic Gait, Parkinsonian Gait, Choreiform Gait, and Ataxic Gait.

The Otago Exercise Programme to prevent falls in older adults: This New Zealand falls prevention exercise program focuses on strengthening leg muscles, balance retraining and walking. It also includes two simple strength and balance

assessment tests: The Chair Stand and Four-Test Balance Scale. The Chair Stand involves a timed, five "sit-to-stand" sequence. Subjects who take longer than 14.5 seconds to complete the test are at a high risk for falls. The Four-Test Balance Scale provides progressively more difficult stance positions to evaluate balance.

The Tinetti Balance Assessment Tool:

Also known as the Tinetti Performance Oriented Mobility Assessment, measures balance and gait function and includes a scoring guide. The test can be completed in 5-10 minutes in your office.

The Berg Balance Scale (BBS):

This test uses 14 simple tasks to assess balance ability. The subject's performance is then scored from zero to four on ability to successfully complete each task, and the numbers are totaled at the end to provide the measure of the subject's overall balance ability from "unable" to "independent". The test takes 15-20 minutes to complete.

Hand Grip Testing: Grip strength effectively screens for deconditioning of the patient.

MANAGEMENT

Specific exercises may be given for any deficits noted. For example, the Otago Exercise Programme can be used to help strength and balance. Use one level more difficult than the patient was able to successfully complete when using balance exercises. These exercises will require monitoring and progression at the appropriate time. Community-based exercise programs may also be available.

TEAM APPROACH TO FALLS PREVENTION

Physician: Treatment requires collaboration between the chiropractor and the patient's primary care physician. Patients who do not have a family physician may access a multifactorial falls risk assessment and community resources through a walk-in clinic or the hospital emergency room. Since pain can cause a fall, any MSK diagnoses found with the assessment may be treated with safe approaches. Balance, gait, strength, and coordination exercises may be given. Be

table 1.1.

RED FLAGS	YELLOW FLAGS	ADDITIONAL QUESTIONS
Was there loss of consciousness at the time of the fall?	How many falls has the patient had?	Was the fall witnessed?
Any amnesia regarding the fall?	Over what time frame?	The specifics regarding the environment/location of the fall?
Did they have a head injury from the fall?	Are they becoming more frequent?	Activity at the time of the fall?
Any shortness of breath at the time of the fall?	What were the circumstances?	The time of day?
Any chest pain?	Were the falls unexplained?	What type of footwear were they wearing?
Any palpitations?	Any near falls in the past?	
Any substance abuse?	Does the patient have dementia?	
Did they have a seizure?	Does the patient have depression?	
Any dizziness (light headed or room spinning)?	Any sleep disturbance?	
Have they had any injuries like fractures from the fall?	Any incontinence?	
Did they need an ambulance or go to the hospital?	Have they had tinnitus (ringing in the ears) in the past?	
Are they under a specialist care for a medical condition?	Any effect of neck movement on dizziness?	
	Can they feel the ground under their feet or are their feet numb?	
	Are they able to get up from the fall on their own?	
	Do they have a Lifeline or similar device?	
	Does the patient have pain anywhere including the cervical and lumbar spine?	
	Was there previous rehabilitation/therapy?	
	What previous imaging was performed?	

sure the physician feels it is safe for the patient to participate.

A thorough medical evaluation and collaboration with the family physician is required when treating any patient with a high falls risk. Medical assessment includes investigating cardiac and lung function. Any special testing or blood work can then be ordered. Screening for the presence of orthostatic hypotension is also essential. A drop in blood pressure with position change could lead to a fall. Record blood pressure and pulse rate supine and then standing at 1 and 3 minutes. A drop of systolic blood pressure of 20 mm or more and/or a drop of diastolic blood pressure of 10 mm or more are of significance. Also of concern is an increased pulse rate of 20 beats per minute (bpm) or greater (possibly caused by volume depletion/dehydration) or a decrease of 10 bpm or greater (possibly caused by baroreceptor altered function). If any of these are noted, it needs to be brought to the attention of the patient's primary care physician.

Also, consult with the physician regarding bone health and to determine if it is safe for the patient to take calcium through diet and/or supplementation and vitamin D.

Pharmacist: A medication review by a physician or pharmacist is also helpful to determine if any pharmaceuticals put the patient at a higher risk of falls. Patients on four or more medications are at a higher risk of falls. The Beers Criteria for Potentially Inappropriate Medication (PIMs) Use in Older Adults includes a list of medications that increase risk of falls. Any change to medication should only be ordered by the patient's physician or pharmacist.

Optometrist: Make sure the patient has had a consult with their optometrist and their prescription is up-to-date. Cataracts put patients at a higher risk of falls.

Chiropodist: Inspect the patient's feet and shoes for any abnormalities. A foot professional like a chiropodist can assist with assessment and treatment of foot issues. Proper footwear in good condition, with a non-slip sole, and low heel is recommended.

Occupational Therapist: A home assessment to ensure a safe environment is recommended, ideally performed by an occupational therapist. The Canadian Chiropractic Association (CCA) Best Foot Forward or the Home Falls and Accidents Screening Tool (HOMEFAST) are helpful and can guide you through an effective assessment. A cane or walker may be of assistance³ and is also best administered by an occupational therapist to ensure safe prescription and use. To determine if a cane is suitable, offer the patient your

hand while walking and see if this proves to be helpful. A walker may be best if offering both your hands for support or using a grocery cart is of most assistance while walking. The proper height for a cane or walker is having the top of the handle at the wrist crease while the patient is standing with arms at their sides and good posture looking straight ahead.

In Ontario, chiropractors can prescribe a disabled parking pass for whether the patient drives or is a passenger. This can reduce falls risk.



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CONCLUSION

Chiropractors have a real opportunity to fill the healthcare gap in falls prevention for the aging and continuing education is required to optimally manage these patients.

For a more complete picture on interprofessional collaboration on falls prevention, read "Community-based falls prevention: Lessons from an interprofessional mobility clinic" in the September, 2014 issue of the *Journal of the Canadian Chiropractic Association*, available for download at www.chiropractic.ca/jcca-online.

ABOUT THE AUTHORS

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Dr. Bauman is currently writing a paper on nonfunctioning pituitary macroadenoma after recent personal and successful treatment for this benign endocrine tumour. Reduced athletic performance is a frequent symptom of the disorder. This paper will help raise awareness of the topic so that it can be better recognised when presenting in chiropractic patients.

RISK ASSESSMENT RESOURCE WEBSITES

1. Activities-Specific Balance and Confidence (ABC) Scale: www.healthcare.uiowa.edu
2. Timed "Up and Go" (TUG) Test: www.rehabmeasures.org
3. NeuroLogic Examination Videos: <http://library.med.utah.edu>
4. The Otago Exercise Programme to prevent falls in older adults: www.acc.co.nz
5. The Tinetti Balance Assessment Tool: www.bhps.org.uk/falls/documents/TinettiBalanceAssessment.pdf

6. The Berg Balance Scale (BBS): www.fallpreventiontaskforce.org
7. Hand Grip Testing: www.ncbi.nlm.nih.gov
8. The Beers Criteria for Potentially Inappropriate Medication (PIMs) Use in Older Adults: www.americangeriatrics.org
9. The Canadian Chiropractic Association (CCA) Best Foot Forward: www.chiropractic.ca/resources/falls-prevention/prevent-falls-in-the-home
10. Home Falls and Accidents Screening Tool (HOMEFAST): www.health.vic.gov.au

References

1. Centers for Disease Control and Prevention (CDC). (September 22, 2014) Falls Among Older Adults: An Overview. Retrieved from www.cdc.gov/homeandrecreationalafety/falls/adultfalls.html
2. The American Geriatrics Society, British Geriatrics Society. (2010) AGS/BGS Clinical Practice Guideline: Prevention of Falls in Older Persons, *J Am Geriatr Soc*.
3. Lam R. Choosing the correct walking aid for patients. (2007) *Can Fam Phys*. 53:2115-6.