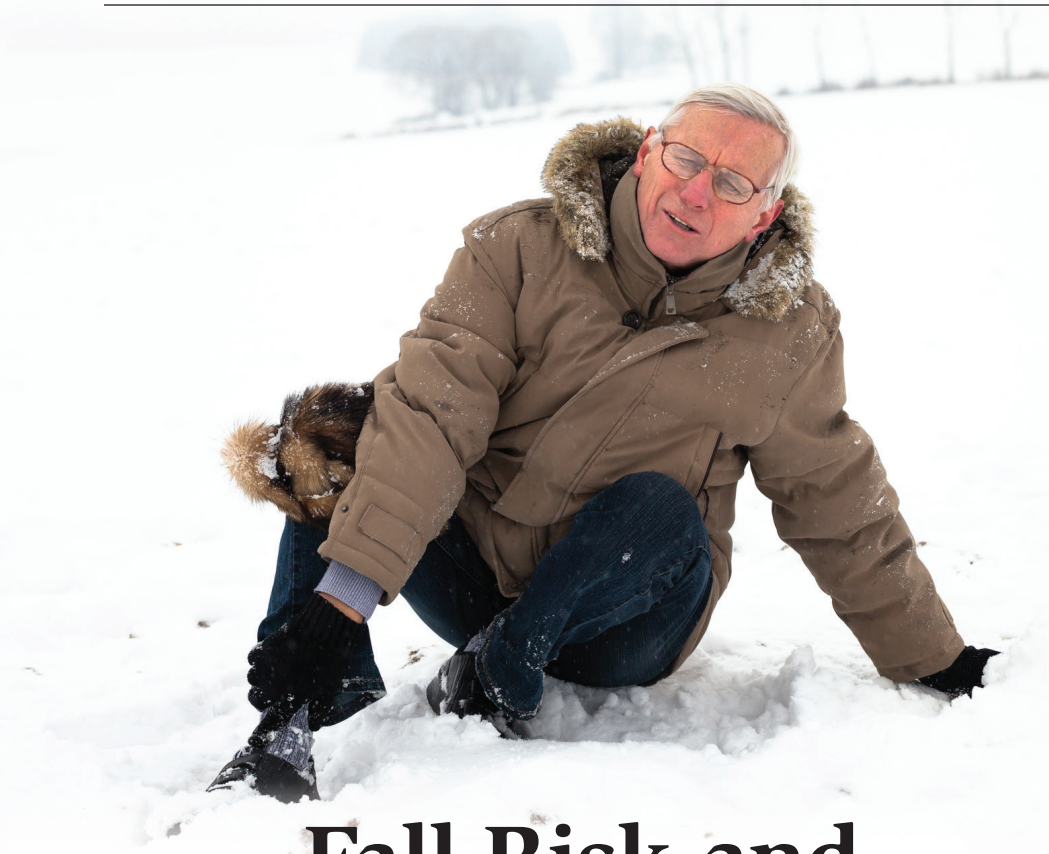

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Fall Risk and Podiatric Intervention

Podiatrists can play a major role in preventing injuries.

BY ROBERT ECKLES, DPM, MPH

Goals and Objectives

After completing the following CE session relating to fall risk in the elderly, the reader will be able to:

1) Describe the epidemiology of the public health issue and its specific medical and financial ramifications.

2) Describe the multiple co-factors which create vulnerability to fall.

3) Describe a rational algorithm for measuring individual vulnerability to fall.

4) Describe a multi-faceted clinical approach to reducing fall vulnerability.

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*Following this article, an answer sheet and full set of instructions are provided.—**Editor***

Epidemiology

For many reasons, people in the United States (and around the world) are living far longer than those in prior generations. We can thank improved public health (clean air and water), vaccination, and smoking cessation initiatives, among other factors, for this. The U.S. Census Bureau predicts that there will be more than 80 million Americans over the age of 65 in

the year 2050, nearly double the number in 2010. Moreover, the relative ratios between age groups has changed. The over-85 segment of our population is projected to make up more than 20% of the entire U.S. population by the year 2050.

Global data (Figure 1) on population cohorts reveal that radical shifts are likely in the next several decades. The largest changes in life expectancy are predicted to be in the over 65 cohort, with the over 100 cohort predicted to increase by more than 1,000%. No matter what the exact numbers are, though, a prime demographic that podiatric medicine serves is set to continue to expand in a remarkable way, and to demand more of us.

Odds are that you know someone or have a close relative who has had a fall in the past 12 months. According to the CDC, one third of older people, older than 65, fall each year. 20% of these individuals have serious injury as a result of the fall: fracture or head injury. 700,000 people are hospitalized annually as a result of a fall, and 250,000 of these are admitted due to hip fractures. Tragically, along with injury rates, the rate of death relating to fall is also rising dramatically (Figure 2). The risk algorithm for falling is complex, and there are many options for intervention. This short summary of the many pathologies and intervention strategies around fall potential should enable the podiatric physician to more accurately (and in concert with nationally regarded standards) assess elderly patients for fall risk and provide mechanical and rehabilitative methods for patients which may reduce individual risk.

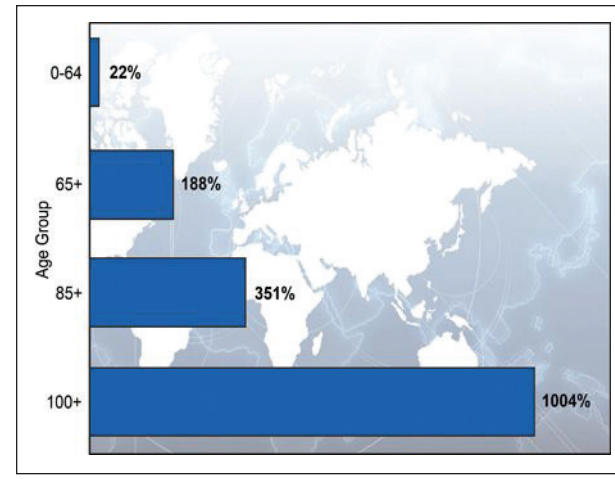


Figure 1: WHO Aging Graphic

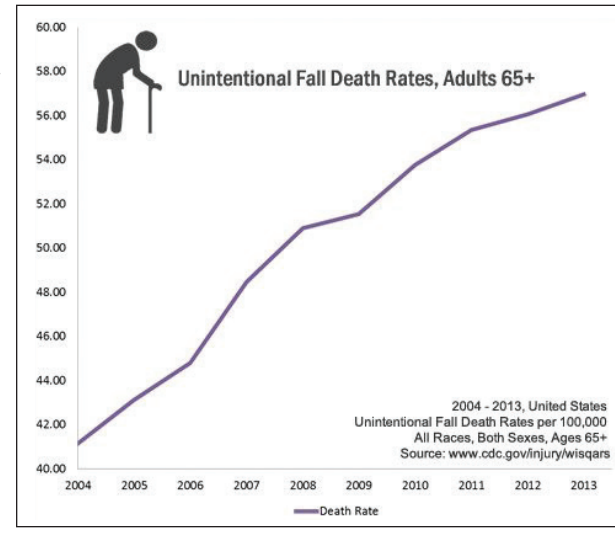


Figure 2: Unintentional Fall Death Rates per 100,000

The fastest growing segment of the elderly population in the U.S. is those over 100 years of age.

Postural and Gait Changes Related to Fall Risk

We know that several changes are consistently seen in gait as we age. Decreased stride length, increased base and often, angle of gait, are common. Strength, balance and ability to adapt to environmental challenges also are noted to decrease, sometimes precipitously, and the individual is affected by one or more of the many medical conditions common to the elderly. Posture changes, with a weakening of abdominal and "core" muscles and a tendency to an "anterior" center of mass are seen. These factors are magnified by reductions in muscle mass as a percentage of body weight, flexibility, and reaction times, the sum of which add to the overall vulnerability of elderly people to fall.

Obesity

There is no doubt that the changing "shape" of America has an effect on fall risk and/or the outcome of fall events. Altered center of gravity and increased resistance to volitional and reflexive muscle activity are complicit in how obesity modifies gait. And clearly, America is more obese than in prior decades, as the Figures 3-4 indicate. Some data indicate[10] that obese individuals have a 25% higher risk of falling than non-obese individuals.

Other sources[14] report that obesity does not in itself produce a higher fall risk, but rather a less robust and effective response by the individual to tripping simulations, which make recovery from a misstep less likely. Obese individuals who do fall are seen to have a higher risk of "activities of daily living" (ADL) disability after a fall than normal weight subjects.[4] Making this risk factor even more complicated are the intertwined matters of sedentary lifestyle, poor sleep (reliance on sleep medications) and other co-morbidities such as hypertension and diabetes, each of which

will make its own contribution to the larger risk pattern.

Medications

Older Americans consume nearly 40% of prescription drugs and 35% of all over-the-counter drugs sold (FDA, 1999). Individuals between the ages of 65 and 69 take nearly 14 prescriptions per year and often have up to five or more prescribers/providers. The potential impact that medicines have on ambulatory health and fall risk may be significant, with diuretics, beta blockers, neuroleptics, anti-hypertensives, benzodiazepines, and anti-depressants all being associated with increased fall risk.[20] Fortunately, with one exception, podiatrists seldom prescribe medicines in these categories. Figure 5, from Woolcott,[20] illustrates the risk ratios associated with specific medication classes.

The Beers Criteria for Potentially Inappropriate Medication Use in Older Adults, published by The American Geriatrics Society, lists hundreds of medicines that are ineffective or inappropriate for older adults. Within this list are at least two commonly prescribed (by podiatrists) medications for neuropathic pain associated with diabetes: gabapentin and pregabalin. The Beers recommendation is that prescription of these medicines is to be avoided in individuals who have significant fall risk or a history of fall. Close monitoring of therapeutic effect vs. adverse events is certainly warranted, therefore, when we engage patients in discussions about these products. Older medicines for neuropathy such as tri-cyclic antidepressants earn an absolute "avoid" rating.

Similarly, one would of course also closely monitor the effects of narcotic pain medication prescribed around elective and non-elective surgical procedures and ensure that elderly patients using these medicines have an informed and supportive family or care structure.

Some data indicate that obese individuals have a 25% higher risk of falling than non-obese individuals.

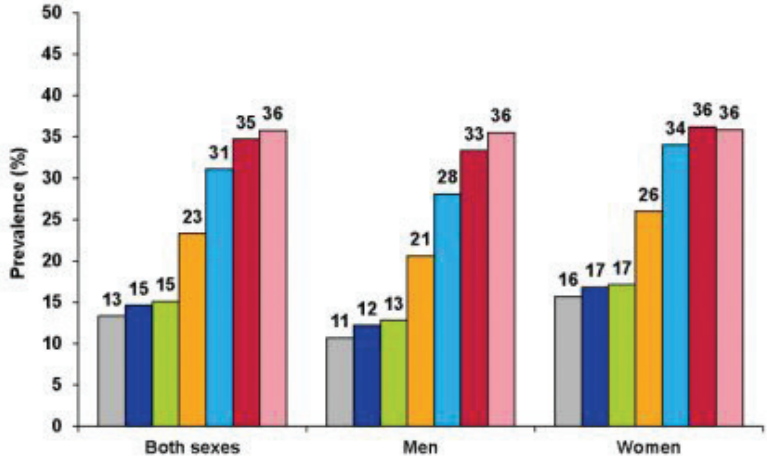


Figure 3: Trends in Obesity

Shoes

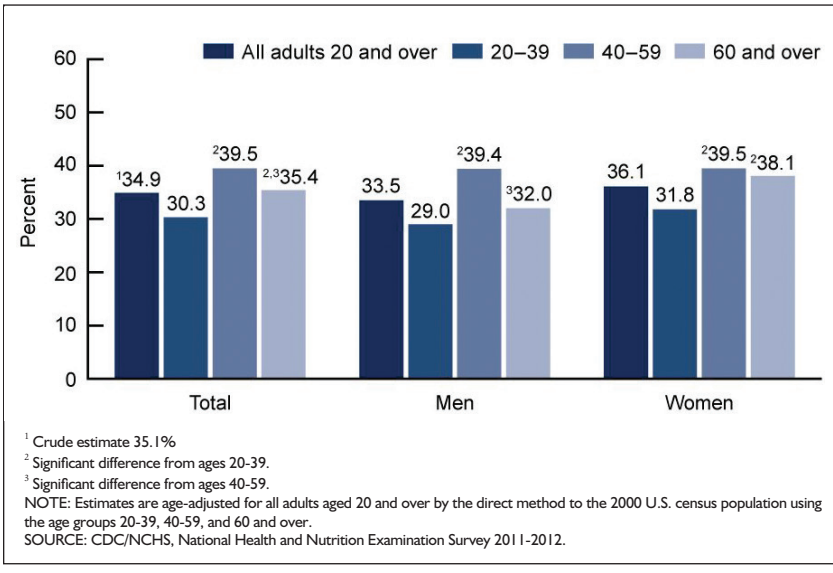
It is recognized that many elderly people wear suboptimal shoes, creating an early and perhaps easier opportunity for assessment and intervention. Studies uniformly show[4,5,7,8,9] that when patients interact with test environments which include obstacles and low friction or wet surfaces, high-heeled shoes create anterior to posterior sway and soft-soled shoes impair medio-lateral balance. Shoes with stiff outsoles and/or athletic shoes perform best in terms of timed navigation, sway and stop-start initiation. Individuals who go barefoot or wear slippers are noted to have increased risk of imbalance and fall. While it may be assumed that a tactile and proprioceptive advantage might be derived from being barefoot, at least one study[13]—(Robbins, in *Age Aging*, 1995—indicated that being barefoot created a substantial diminution in joint position awareness.

This point may be one of the strongest made, in that surveys (Mickle, KJ, at the Footwear Biomechanics Symposium, Taipei, 2007) reveal, at least in warm climate environments, that nearly a third of men and women uniformly go barefoot or wear slippers inside the house. Reviews of footwear used in nursing homes and rehabilitation facilities mirror this finding. Higher peak plantar pressures also found in barefoot subjects introduce the subjective component of pain, which will be discussed later.

A parallel finding (also Robbins, 1995) is that use of running shoes or shoes with thick soft midsoles

may impair joint position sense. This evidence enables a somewhat confounding argument against the use of some "diabetic" footwear and points the clinician towards an individual assessment and prescription for each patient based on clinical findings and suitability for such shoes. A fair assessment of this footwear type would also include the fact that highly moldable, accommodative insoles can be presumed to create a net gain for the user in terms of sensory feedback—denser proprioceptive feedback may create greater position sense. Certainly, accommodative insoles are, at a minimum, a substitute for reduced plantar fat pad thickness and may be significantly pain-relieving where plantar forefoot deformity is present.

Anti-convulsants have received a cautionary status label from the Beers Criteria.



[1] Crude estimate 35.1%
[2] Significant difference from ages 20-39.
[3] Significant difference from ages 40-59.
NOTE: Estimates are age-adjusted for all adults aged 20 and over by the direct method to the 2000 U.S. census population using the age groups 20-39, 40-59, and 60 and over.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey 2011-2012.

Figure 4: Age-Adjusted Prevalence of Obesity, By Sex and Age Group, Among Adults Aged 20 and Over: United States, 2011-2012

Fall Risk Increasing Drugs and Odds Ratios

Drug Class	Odds Ratio	95% CI
Antihypertensive agents	1.24	1.01–1.50
Diuretics	1.07	1.01–1.14
B blockers	1.01	0.86–1.17
Sedatives and hypnotics	1.47	1.35–1.62
Neuroleptics and antipsychotics	1.59	1.37–1.83
Antidepressants	1.68	1.47–1.91
Benzodiazepines	1.57	1.43–1.72
Narcotics	0.96	0.78–1.18
Nonsteroidal anti-inflammatory drugs	1.12	1.01–1.44

Figure 5: Fall Risk Increasing Drugs and Odds Ratios, Woolcott [2009]

Shoes also play a part in the development of foot pain, itself linked to fall risk. Some data reveal that high percentages of older people wear shoes that fit poorly. Overly narrow footwear being identified as a common selection,[9] it is easy to correlate this with the development of painful skin lesions associated with digital and/or first ray deformity.

Foot Pain

It is intuitive that painful feet, no matter what the cause, will alter gait and perhaps lead to an increased fall risk, and indeed, Menz reported in the *Journal of Gerontology,* 2006 that foot pain is an independent and statistically significant factor in fall risk even after accounting for age and other physiologic factors. Decreased stride length, change in base of gait, increased sway, increased postural "stiffness" (see fear of falling), and aversion tactics are frequently seen in patients with foot pain. All of these may contribute to or be independent risk factors for fall.

Here of course, podiatrists hold court. Reduction of foot pain from even the simplest of podiatric interventions is preserving of function through pain reduction. We all appreciate the role that off-loading plays in preventing and healing plantar wounds, but few of us think about the off-loading benefit of simple callus debridement. Young and Cavanagh, in *Diabetes Medicine,*[20-22] reported mean peak pressures, especially

at the forefoot, were reduced by 26% by simple sharp debridement of callus.

But of course, the variation and complexity of foot pain, and the many surgical, medical, and mechanical interventions that we practice make this a text in itself. Suffice it to say that no patient being assessed and treated for fall risk should fail to have any and all appropriate interventions to relieve pain.

Fear of Falling

This list includes anyone who has fallen, has witnessed the effects of a fall on a neighbor or relative, or who has concurrent medical or surgical issues which cause weakness or is simply at greater risk of falling, independent of any physical disability they may have. Data indicate that there are measurable changes in gait, muscle, and visual activity that develop in people who have heightened fall anxiety. Young wrote, in *Gait & Posture,*[15,20,21] that people who fear falling develop conservative "stiffening" strategies in the face of perceived threats.

Faced with encountering uneven surfaces, obstacles, or low friction surfaces, study subjects created muscular "preparedness" which led to either an improved outcome, usually where the task was simple and required little in the way of solution, or often, a negative outcome where the "stiffness" led to reduced acquisition of sensory information, and therefore less adaptability to the environmental challenge. This most often occurred with more complex, cognitively demanding tasks.

Visual centeredness, that is, the acute visual focus of the subject, was also noted to change. Subjects who had low fear of falling (FOF) were able to track multiple objects, variables, and risk factors in a test environment; in other words, to focus on the "whole" of the task. Subjects with high FOF were found to visually fixate on immediate threats, and to therefore develop inappropriate and inadequate compensation strategies to solve the entire task. Of course, decreased visual acuity is also a matter of concern. It may not only lead to a failure to appreciate an ambulatory challenge, a failure to accurately "target" a safe pathway, but also contribute to anxiety about safe ambulation. Figure 6 illustrates the FOF algrorithm.

Proximal stimulation of legs may improve balance/gait performance in diabetics.

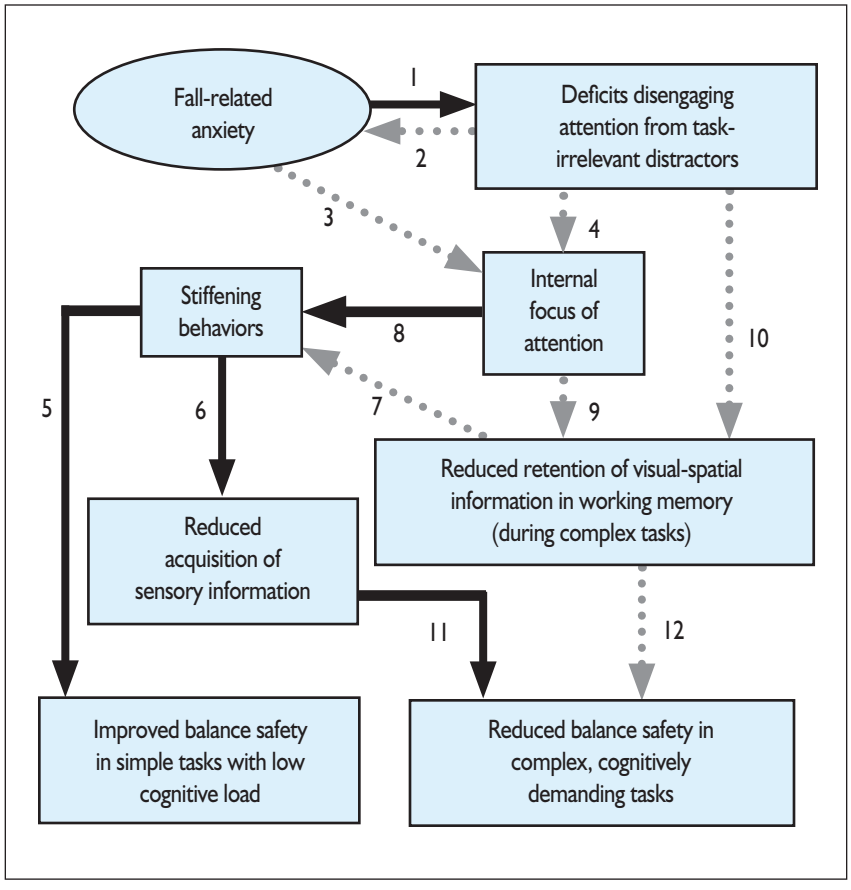


Figure 6: The FOF Algorithm

Individuals also develop a higher fall risk when and if they have clinical signs of depression. Depression rates are known to increase (CDC 2015) in elderly cohorts who have more than one chronic health problem or are home-bound, making this a substantial group of individuals. Depressive symptoms were found to be consistently associated with falls in older people, according to a meta-analysis (which reviewed 25 studies involving more than 21,000 participants) published in the *Journal of the American Geriatric Society.*[6]

This realm of risk is one that demands the podiatrist reach out to other professionals: social workers, occupational therapists, or physical therapists; to initiate necessary adaptive or corrective methods to enable ADL and other activities and to increase adaptive potential across a range of environments.

Assessment of Risk

In this era of meaningful use, many patient characteristics are measured and tracked. I advocate that podiatrists use the CDC screening algorithm (Figure 7) which is part of their STEADI (Stopping Elderly Accidents, Deaths and Injuries Initiative).

CDC recommends evaluation of all patients over the age of 65 for the following:

- Lower extremity weakness
- Gait and balance problems
- Use of psychoactive medicines
- Dizziness
- Poor vision
- Foot/shoe problems
- Home safety

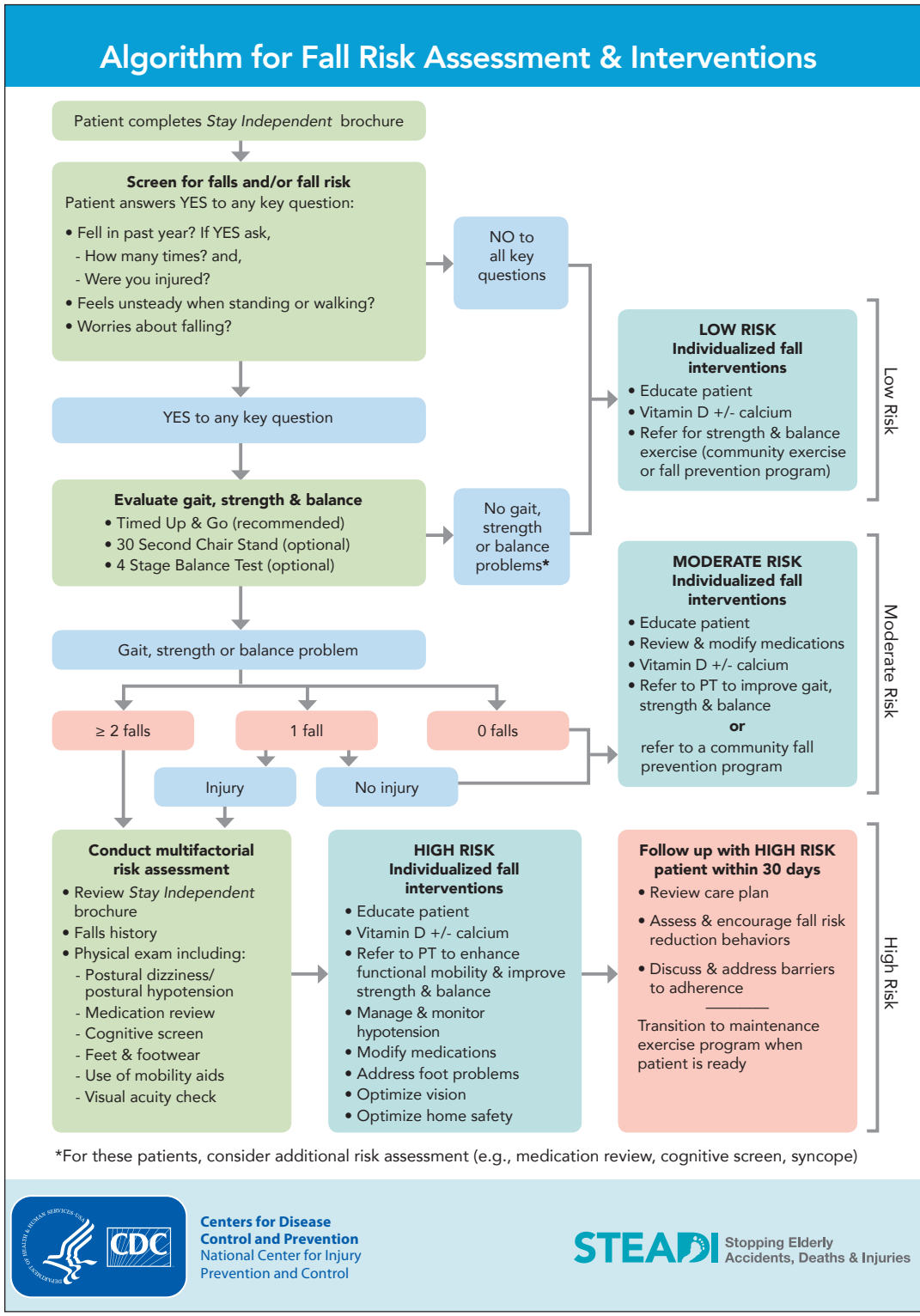


Figure 7: Algorithm for Falls Risk & Assessment

It's easy to argue that as podiatrists, we are already uniquely placed to conduct these evaluations. Apart from visual acuity examination and home safety assessments, we already have the expertise, if not the habit, of evaluating nearly all the other elements on this list. The Timed Up and Go test, TUG, for short, is simple and is a highly validated assessment (Figure 8). A patient is timed performing the following maneuver: rising from a chair, walking three meters, turning around, returning to the chair, then sitting down again.

A score of 10 seconds or less generally indicates normal mobility. 11-20 seconds is common for frail elderly patients, a score over 20 indicates the individual requires assistance, and a score of 30 or more indicates heightened fall risk. The Berg

Balance Scale, a more complex index consisting of 14 balance-related tasks also has a very high clinical validity rating and may be a useful addition to the podiatry practice, but requires nearly 20 minutes for completion and may be best utilized when at-risk patients are identified.

Intervention by the Podiatrist

In 2011, the *British Medical Journal* published proof that podiatric medical intervention for reduction of fall risk works. Using simple tools, Australian researchers Spink, Menz, Landorf, and others[17] were able to create a 36% reduction in falls in an intervention group over a 12-month period when compared to a control group. Intervention in this case was remarkably simple. Foot orthoses, advice on shoes (and a subsidy to purchase appropriate shoes), instructions for home-based rehab/exercise, and "routine" podiatry care for the year (the control group received only the podiatry care) were provided. The intervention group adhered to recommendations at high levels and notably, of the approximately 150 individuals in each group, seven falls leading to fracture occurred in the control group, and one in the intervention group.

It seems clear that podiatrists have an obligation to participate in the reduction of fall potential. So what are the tools to bring to the fight? As has already been mentioned, review of medications, simple palliative reductions, as well as surgical remediation of bone and joint deformity clearly have a place, as does accommodation and modification of the plantar interface. But what role do mechanical devices, foot orthoses, and AFOs have?

Spink used a dual density, non-custom orthosis in the intervention group.

AFOs

There is abundant information available that supports the use of AFO devices for patients who have had strokes.[2,16,19] Gait parameter changes such as increased speed of walking, improved balance, and reduction of sway are reported. Overall improvement in gait safety has been well documented in the literature. There is even data that supports the use of AFOs or even tape used on the legs of neuropathic patients with diabetes as a means of recruiting and using proprioceptive pathways.[15] However, there is a dearth of information supporting the use of AFOs for balance control and improved gait efficiency in patients who are neuro-muscularly intact.

Where a patient can be shown to exhibit isolated weakness of a muscle (group), there would seem to be a compelling reason to prescribe an AFO directed to the identified deficiency, but caution is warranted. Dynamic balance, which is balance that is achieved by utilization of muscles "on the fly" so to speak, requires that joints move and that muscles guide and stabilize these motions as the individual encounters reactive forces. This may worsen if motion around critical joints is restricted.

Foot orthoses contribute to decreased fall risk.

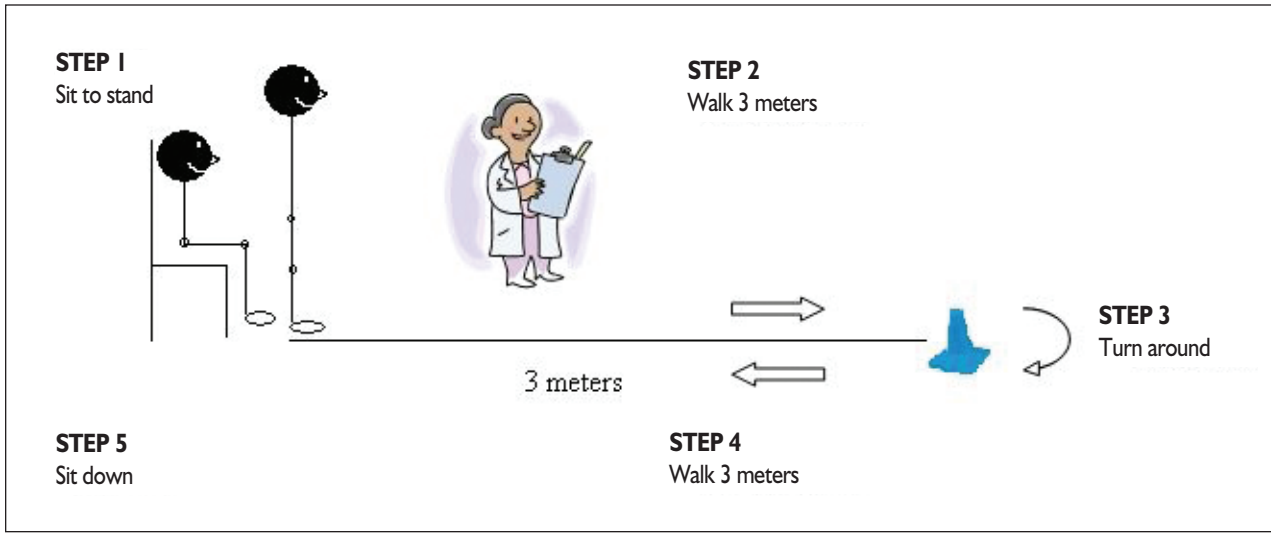


Figure 8: The TUG Test

Foot Orthoses

An article by Spink in the *British Medical Journal*[17] solidified a position for the use of some form of orthosis in the management of fall risk, but of course there are many types of devices from which to select. The Spink study group utilized a prefabricated orthosis which featured a dual density design: a firm high density base with a softer accommodative layer against the skin. Whether this is optimum for your patient is unclear, just as it is always subject to individual assessment when determining the relative clinical value of "custom" vs. pre-fabricated devices.

One point that is without doubt, however, is that the dual density concept is important. Soft tissue supplementation is critical, as noted earlier, and the firm base of the device enables a level of mechanical control that may itself prove effective in reducing risk. Doug Richie, in *JAPMA*,[12] references voluminous data surrounding concepts of balance and postural control relating to ankle instability and recurrent injury. The article leaves no doubt that an orthosis can provide positive proprioceptive feedback which can improve balance performance, in part independent of the direct physical force applied to the foot.

Footgear with low heel height may reduce fall risk.

In other words, somatosensory input may, with or without the direct mechanical effect of the orthosis, allow an individual to maintain a more upright center of mass and pressure. Interestingly, while prefabricated devices have been shown to have a positive effect, there appears to be a positive correlation between the degree of customization of the orthosis and clinical outcome. Certainly, those individuals with significant foot deformity appear to benefit from customization strategies.

Munn[11] proposes that pronation control of the foot is important in reducing lateral instability. The proposed mechanism is based on observations that sudden inversion motion (instability) may be immediately preceded by the subtalar joint moving beyond its end range of motion in pronation. This theory has not been validated, and controversy continues today regarding the ability of foot orthoses to assert sufficient force to achieve significant postural outcomes generally. Regardless, the bulk of the evidence seems to point toward the use of some form of orthosis as a standard measure in the podiatrist's overall fall prevention strategy.

Fear of falling is linked to reduced spatial memory, visual impairment, and the "stiffening" response.

Conclusion

In sum, it seems that American podiatrists have a remarkable opportunity to again create, as we have done throughout our history, a significant shift in the personal and medical narratives of countless Americans. And given our greater access to surgical and pharmacologic remedies, alongside mechanical strategies, we should do even better for at-risk populations than podiatrists have done overseas.

James Christina, representing the APMA, directed a webinar in February of 2015 which, among other forums on this topic in the past five years, strongly advocated for podiatrists assuming the role of assessors and key providers in this challenge. I hope that national and regional leaders of this profession will move to implement real initiatives that will not only be important to our patients and their families, but to the profession as a whole. **PM**

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CME EXAMINATION

1) Which of the following is the fastest growing segment of the elderly population in the U.S.?

A) The 65-75 group
B) The over 90 group
C) 100 +
D) None of these.

2) Which of these drugs, frequently prescribed by podiatrists, has received a cautionary status label from the Beers Criteria?

A) Anti-convulsants
B) Neuroleptics
C) Anti-hypertensives
D) Benzodiazepines

3) Which of these is true about the elderly who may be diabetic?

A) These patients are not unique in terms of fall risk.
B) Proximal stimulation of legs may improve balance/gait performance.
C) These individuals should uniformly be provided thick-soled running or "diabetic" footwear.
D) Medications used to manage neuropathy and glucose have no effect on balance.

4) Which of these is true about podiatric intervention in fall risk as reported by Spink?

A) Foot care by itself was seen to make significant differences in outcomes.
B) Only the outcome, not the frequency of falls, was noted to change.
C) As the data come from a sample of less than three dozen, it is hard to extrapolate the results.
D) A dual-density, non-custom orthosis was used in the intervention group.

5) In which of these ways can a foot orthosis contribute to decreased fall risk?

A) Increase proprioceptive feedback from the foot.
B) Prevent an individual from reaching an "end range of motion".
C) Decreased pain due to soft tissue supplementation.
D) All of these.

6) Fear of falling is a complex concept linked to which of these groups of factors?

A) Visual acuity, hearing loss, arthritis.

Continued

B) Reduced spatial memory, visual impairment, "stiffening" response.
C) Anxiety, obesity.
D) None of these.

7) Footgear may reduce fall risk when prescribed within which of these parameters?
A) Low heel height.
B) Thick cushioned midsole.
C) Tight fitting.
D) None of these.

8) AFO use for fall risk reduction is not generally recommended, except in which of the following circumstances?
A) Isolated muscle/tendon weakness.
B) Neuromuscular pathology.
C) Post CVA.
D) All of these.

9) Which of these statements accurately describes the TUG test?
A) The test is only valid for people who have had a stroke.
B) The test result is invalid if the patient has diabetes.
C) The test must be performed by a medical doctor.
D) The test is highly sensitive for detecting vulnerability.

10) Which of these statements is true regarding obesity and falling?
A) The data absolutely link frequency of fall to BMI.
B) Fall outcomes are worse.
C) Only those who are obese AND diabetic have increased fall risk.
D) Only obese persons over 80 have increased risk.

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Enrollment/Testing Information and Answer Sheet

Continuing Medical Education

Note: If you are mailing your answer sheet, you must complete all info. on the front and back of this page and mail with your credit card information to: **Program Management Services, P.O. Box 490, East Islip, NY 11730.**

TESTING, GRADING AND PAYMENT INSTRUCTIONS

(1) Each participant achieving a passing grade of 70% or higher on any examination will receive an official computer form stating the number of CE credits earned. This form should be safeguarded and may be used as documentation of credits earned.

(2) Participants receiving a failing grade on any exam will be notified and permitted to take one re-examination at no extra cost.

(3) All answers should be recorded on the answer form below. For each question, decide which choice is the best answer, and circle the letter representing your choice.

(4) Complete all other information on the front and back of this page.

(5) Choose one out of the 3 options for testgrading: mail-in, fax, or phone. To select the type of service that best suits your needs, please read the following section, "Test Grading Options".

TEST GRADING OPTIONS

Mail-In Grading

To receive your CME certificate, complete all information and mail with your credit card information to: **Program Management Services, P.O. Box 490, East Islip, NY 11730. PLEASE DO NOT SEND WITH SIGNATURE REQUIRED, AS THESE WILL NOT BE ACCEPTED.**

There is **no charge** for the mail-in service if you have already enrolled in the annual exam CME program, and we receive this exam during your current enrollment period. If you are not enrolled, please send $29.00 per exam, or $249 to cover all 10 exams (thus saving $41 over the cost of 10 individual exam fees).

Facsimile Grading

To receive your CME certificate, complete all information and fax 24 hours a day to 1631-532-1964. Your CME certificate will be dated and mailed within 48 hours. This service is available for $2.95 per exam if you are currently enrolled in the annual 10-exam CME program (and this exam falls within your enrollment period), and can be charged to your Visa, MasterCard, or American Express.

If you are *not* enrolled in the annual 10-exam CME program, the fee is $29 per exam.

Phone-In Grading

You may also complete your exam by using the toll-free service. Call 1-800-232-4422 from 10 a.m. to 5 p.m. EST, Monday through Friday. Your CME certificate will be dated the same day you call and mailed within 48 hours. There is a $2.95 charge for this service if you are currently enrolled in the annual 10-exam CME program (and this exam falls within your enrollment period), and this fee can be charged to your Visa, Mastercard, American Express, or Discover. If you are not currently enrolled, the fee is $29 per exam. When you call, please have ready:

1. Program number (Month and Year)
2. The answers to the test
3. Credit card information

In the event you require additional CME information, please contact PMS, Inc., at **1-631-563-1604**.

ENROLLMENT FORM & ANSWER SHEET

Please print clearly...Certificate will be issued from information below.

Name _____ Email Address _____
Please Print: FIRST MI LAST

Address _____

City _____ State _____ Zip _____

Charge to: _____Visa _____ MasterCard _____ American Express

Card # _____ Exp. Date _____ Zip for credit card _____

Note: Credit card is the only method of payment. Checks are no longer accepted.

Signature _____ Email Address _____ Daytime Phone _____

State License(s) _____ Is this a new address? Yes _____ No _____

Check one:

_____ I am currently enrolled. (If faxing or phoning in your answer form please note that $2.95 will be charged to your credit card.)

_____ I am not enrolled. Enclosed is my credit card information. Please charge my credit card $29.00 for each exam submitted. (plus $2.95 for each exam if submitting by fax or phone).

_____ I am not enrolled and I wish to enroll for 10 courses at $249.00 (thus saving me $41 over the cost of 10 individual exam fees). I understand there will be an additional fee of $2.95 for any exam I wish to submit via fax or phone.

Over, please

ENROLLMENT FORM & ANSWER SHEET *(continued)*

EXAM #6/20
Fall Risk and Podiatric Intervention
(Eckles)

Circle:

1.	A	B	C	D	6.	A	B	C	D
2.	A	B	C	D	7.	A	B	C	D
3.	A	B	C	D	8.	A	B	C	D
4.	A	B	C	D	9.	A	B	C	D
5.	A	B	C	D	10.	A	B	C	D

Medical Education Lesson Evaluation

Strongly agree [5]	Agree [4]	Neutral [3]	Disagree [2]	Strongly disagree [1]

1) This CME lesson was helpful to my practice ____

2) The educational objectives were accomplished ____

3) I will apply the knowledge I learned from this lesson ____

4) I will makes changes in my practice behavior based on this lesson ____

5) This lesson presented quality information with adequate current references ____

6) What overall grade would you assign this lesson?

A B C D

7) This activity was balanced and free of commercial bias.

Yes _____ No _____

8) What overall grade would you assign to the overall management of this activity?

A B C D

How long did it take you to complete this lesson?

_____hour _____minutes

What topics would you like to see in future CME lessons ? Please list :

_____

_____

_____

_____

_____