



# Foot Examination for Older Adults

Kirstyn James, MD, MRCPI,<sup>a,b,d</sup> Ariela R. Orkaby, MD, MPH,<sup>a,c,d</sup> Andrea Wershof Schwartz, MD, MPH<sup>a,c,d</sup>

<sup>a</sup>New England Geriatric Research, Education and Clinical Centers, Veteran Affairs Boston Healthcare System, Boston, Mass; <sup>b</sup>Division of Gerontology, Beth Israel Deaconess Medical Center, Boston, Mass; <sup>c</sup>Department of Medicine/Division of Aging, Brigham and Women's Hospital, Boston, Mass; <sup>d</sup>Harvard Medical School, Boston, Mass.

## ABSTRACT

The foot changes with age. Foot disorders in older adults are associated with falls, lower limb ulcers, and pain. Physical examination of the feet as part of the routine assessment of older adults is imperative to detect foot problems. Foot pain and pathologies are common in older adults. Regular foot care is important to prevent these issues. However, some older adults may find it difficult to complete foot care, including cutting toenails. Regular foot examination can detect common foot problems, functional decline, and is recommended for preventing falls. We describe a technique for performing a focused examination of the feet for older adults. This review addresses current podiatric issues in older patient populations and describes a method for foot examination to address the needs of older adults that can be incorporated into patient assessments in any clinical setting.

© 2020 Elsevier Inc. All rights reserved. • *The American Journal of Medicine* (2021) 134:30–35

**KEYWORDS:** Falls; Frailty; Foot examination; Older adults; Podiatry

## INTRODUCTION

### “I Just Fell”: Case Study

The 82-year-old patient with a past medical history of coronary artery disease, depression, and visual and hearing impairments made his way slowly into the clinic room. He described 2 falls that had occurred in the preceding 2 weeks. The treating clinician performed a comprehensive assessment addressing organ systems and domains that may be related to falls, including orthostatic hypotension, osteoarthritis, glaucoma, and polypharmacy. During history taking, the patient mentioned that his feet were painful with ambulation and when wearing shoes.

**Funding:** This material is the result of work supported with resources and the use of facilities at the Veteran Affairs Boston and New England Geriatric Research, Education and Clinical Centers. The contents do not represent the views of Veterans' Affairs or the US government. ARO is supported by VA CSR&D CDA-2 award [IK2-CX001800](#), [NIA R03-AG060169](#).

**Conflicts of Interest:** None.

**Authorship:** All authors had access to the data and a role in writing this manuscript.

Requests for reprints should be addressed to Kirstyn James, MD, MRCPI, Consultant in Geriatric Medicine, Cork University Hospital, Wilton, Cork, Ireland.

E-mail address: [kirsjames@rcsi.ie](mailto:kirsjames@rcsi.ie)

During the physical examination, it was noted that the patient had difficulty removing his shoes and socks. The patient reported that cutting his toenails had recently become a challenge. Inspection of his feet revealed thickened and dystrophic toenails that had grown long beyond the edges of the toes. The skin on the lower limbs and feet was dry and flaky. Foot hygiene was suboptimal. On examination of gait, he was noted to have a slow walking speed.

### Foot Examination in Older Adults: Challenging But Essential

Performing a comprehensive and relevant physical examination, including the feet can be a challenge. Time constraints, coupled with the ever-increasing accessibility to and advancing technology of diagnostic tests may restrict a physician from completing a physical examination.<sup>1</sup> An observational study of the behaviors of interns and residents in the United States found that the mean time spent on physical examination during patient assessments was 5.29 minutes (range 3-20 minutes). This study also found that trainees examined for pedal edema in only 32% of cases and examined pedal pulses in 40% of cases.<sup>2</sup> Even in specialties where foot pathologies are common such as rheumatology, examination of the feet may be overlooked or deemed burdensome.<sup>3</sup> However, the American Association of Medical Colleges continues to

emphasize the importance of the physical examination as a core component of clinical skills.<sup>4</sup> Moreover, the feet are a unique body part for which physical examination, including inspection and palpation, remains a critical diagnostic tool.

The importance of the foot examination is well recognized. In the early 20th century, Sir William Osler encouraged physicians to “Make a thorough inspection. . . . Always look at the feet,” and contemporary physicians such as Dr. Atul Gawande continue to advise “always examine the feet.”<sup>5,6</sup>

The foot changes as we age, increasing the importance of examining feet and providing foot care in older adults. This issue has been recognized at health policy level. The 1981 White House Conference on Aging recommended that “comprehensive foot care be provided for the elderly in a manner equal to care provided for other parts of the human body, to permit patients to remain ambulatory.”<sup>7</sup>

This review summarizes changes in the aging foot and podiatric problems that may be more common in older patients. We then describe a method for physical examination with a specific focus on the needs of older patients.

## Pathophysiology: Changes to the Aging Foot

Loss of elastin and collagen fibers contribute to changes in the aging foot and can cause hard, dry skin on the plantar surface. As a result, hyperkeratosis is common in older adults. Age-related changes in foot muscle, joints, soft tissue, and posture also occur and may impair mobility.<sup>8</sup> There is often a change in the size and shape of the foot that may affect the fit of shoes.

Foot pain is common in older adults. A 2011 meta-analysis of 31 studies (including 75,505 participants) found a prevalence of foot pain in 24% (95% confidence interval [CI] 22%–25%) of adults ages 45 years and older.<sup>9</sup>

Older adults are also more likely to have conditions associated with foot pathology such as diabetes, peripheral arterial disease, and neuropathy.<sup>10,11</sup> Osteoarthritis may result in pain and bony deformities of the foot.<sup>12</sup> Diuretic therapy increases the risk of gout, which can result in foot pain and restricted mobility.<sup>13</sup>

## Clinical Presentation

Adequate foot care is important for maintenance of health. Undetected and untreated foot ulcers may result in amputation or death.<sup>14</sup> There is a well-described relationship between foot disorders and falls and gait disorders.<sup>15,16</sup> A 2018 meta-analysis of 15 studies found that older adults who have falls are more likely to experience foot pain and bony deformities.<sup>15</sup> Patients with foot problems are more likely to have impaired functional status and mobility.<sup>17</sup>

Furthermore, suboptimal foot care can lead to declining mobility and physical activity and may portend future difficulties with managing one’s own health.<sup>18</sup> This can in turn contribute to weight gain, joint pain, falls, and reduced cardiovascular function and potentially result in increased risk of frailty, impaired functional status, and poorer performance in balance assessments.<sup>19</sup>

Cutting toenails requires the ability to bend over, adequate visual acuity, and fine motor skills. Difficulty in performing foot care is prevalent among older adults. A study of 100 hospitalized older adults (age range 64-97 years) in the United Kingdom found 89% of participants could not cut their own toenails and only 1 participant had no issues. A total of 12% of participants had dirt visible between their toes.<sup>20</sup> Observational studies of community-dwelling older adults in

the United Kingdom and Italy found between 30%-77% have difficulty cutting their own toenails.<sup>21,22</sup>

In a 2019 cross-sectional study of 50 patients at a Veterans Affairs (VA) Geriatric Medicine clinic, we found that 29% could trim their own toenails, and 18% had long toenails.<sup>23</sup>

Toenail pathologies are also common. A 2004 study of 784 participants ages 65 and older and living in the United States found a prevalence of nail disorders of almost 75%. The study also found that 5.2% of nondiabetic participants had altered lower extremity sensation.<sup>24</sup>

There are many potential barriers to maintaining adequate foot care, and many patients with suboptimal foot health may not be visiting a podiatrist (Table 1).<sup>25</sup>

The mean rate of growth of toenails is 1-2 mm per month and detection of long toenails may suggest a decreased

## CLINICAL SIGNIFICANCE

- Foot disorders in older adults are associated with falls and reduced mobility.
- Suboptimal foot hygiene may be an indicator of functional decline.
- Foot examination is an important component of the assessment of an older adult.
- This review describes a concise, focused method for foot examination.

**Table 1** Barriers to Performing Foot Care

| Diagnosis                            | Effect on ability to perform foot care                     |
|--------------------------------------|--|
| Arthritis: spinal, hip, knee         | Cannot reach feet  |
| Pain                                 |  |
| Obesity                              |  |
| Arthritis of small joints of hands   | Impaired dexterity   |
| Neurological conditions (eg, stroke) | Impaired fine motor skills                                 |
| Dementia or cognitive impairment     | May be unable to complete/remember complex tasks           |
| Visual impairment                    | Cannot see toenails  |
| Neuropathy                           | May not sense development of foot pathology such as ulcers |
| Thickened toenails / onychomycosis   | Cannot cut through toenails                                |
| Peripheral arterial disease          | Foot pain  |
| Orthostatic hypotension/Vertigo      | Difficulty bending down                                    |

**Table 2** Foot Examination for Older Adults Parts 1 and 2: History and Examination**Part 1: History**

Ask the patient if they have a history of:

- Falls or fear of falling
- Visual impairment
- Arthritis
- Diabetes
- Peripheral arterial or venous disease
- Smoking
- Obesity
- Foot wounds or skin problems

Ask the patient the following questions:

- Do you have foot or leg pain?
- Do you experience tingling, burning, or numbness in your feet or legs?
- Do you ever go barefoot?
- Do you need any help washing, drying, or inspecting your feet?
- How do you get your toenails cut?
- Do you see a podiatrist?

**Part 2: Examination**

Footwear

- Can they remove and replace shoes and socks without assistance?<sup>39</sup>
- What type of shoes are they wearing (eg, slip on, laces, Velcro)?
- How worn is the footwear? Is it appropriate for the season?
- Are they wearing socks?

Inspect skin for the following:

- Hygiene (particularly dirt and moisture between toes)
- Dryness
- Hyperkeratosis (calluses and corns)
- Fissures
- Ulcers

Inspect nails for the following:

- Length
- Thickening
- Ingrown/broken
- Fungal infection

Examine the foot for the following:

- Bony deformity
- Hallux valgus
- Hammer/overlapping toes
- Foot pain/tenderness
- Reduced range of motion
- Pes planus (flat foot)

Complete a vascular and neurological assessment:

- Is temperature equal in both feet?
- Is there an absence or reduction of hair growth?
- Is there edema present?
- Check pedal pulses
- Is light touch sensation intact (Ipswich touch test)?<sup>40,\*</sup>

\*The Ipswich Touch Test is a validated test of light touch sensation. It is performed on bare feet by assessing light touch sensation on the tips of the hallux, third and fifth toes bilaterally using the index finger. If sensation is altered at 2 or more locations examined, the test is considered abnormal.

ability to complete personal care of the lower extremities.<sup>26,27</sup> Maintaining basic foot hygiene may be difficult for patients with declining cognition, function, and changing care needs.<sup>26,28</sup> An older person who requires assistance with foot care relies on the availability of a caregiver or access to appropriate foot care services.<sup>25</sup>

**Table 3** Foot Examination for Older Adults Part 3: Patient Education<sup>41</sup>

How to care for your feet

- Avoid smoking.
- Avoid temperature extremes on your feet (too hot or cold).
- Avoid going barefoot.
- Wash your feet daily and dry thoroughly, especially between your toes.
- Inspect your feet every day for cuts and blisters.
- If you cut your own toenails, cut them straight across.
- Check inside and outside your shoes for foreign objects.
- Wear well-fitting shoes with a flat or low, wide heel, and slip-resistant soles.<sup>42</sup> Avoid slip on shoes and flip flops and choose shoes with laces or Velcro.
- Replace your shoes annually.
- If you notice a problem with your feet, contact your doctor.

The foot becomes broader with age, and older adults may need to adjust the size and type of footwear they wear.<sup>29</sup> Ill-fitting footwear is prevalent in older adults (34%-78%) and is associated with hyperkeratosis, foot pain, and deformities, as well as, amputation in patients with diabetes.<sup>30-32,12</sup> Falls are more likely to occur while wearing slippers, socks, or walking while barefoot.<sup>33</sup>

**Assessment and Diagnosis**

Foot problems may be underrecognized by patients. A 1998 survey of 128 older adults (ages  $\geq 65$ ) found that although many participants self-reported issues with their feet (71%), far fewer recognized these issues as a potential medical problem (26%) and only 39% had sought medical attention.<sup>34</sup>

The Centers for Disease Control and Prevention (CDC) Stopping Elderly Accidents, Deaths & Injuries (STEADI) initiative recommends an annual foot examination as part of a falls prevention assessment.<sup>35</sup> In parallel, the joint American Geriatrics Society (AGS) and British Geriatrics Society (BGS) 2010 falls prevention guideline recommends performing a foot examination and reviewing patients' footwear when screening for and assessing after a fall.<sup>16</sup> A 2001 review authored by a podiatrist recommended that every older adult's feet should be assessed at an initial visit with a medical physician and can aid in improving foot health in older adults by examining the feet and then referring the patient to a podiatrist, if appropriate.<sup>36</sup> Additionally, a recommendation from podiatrists is that older adults and those with multiple chronic conditions should undergo regular assessment of their foot health and knowledge of and ability to perform foot care.<sup>37</sup>

However, it can be challenging to complete all components of a comprehensive assessment during a single consultation. Addressing the "Geriatric 5Ms" domains of Mobility, Medications, Mind, Multicomplexity, and Matters Most can be a useful model around which to structure assessment of an older person.<sup>38</sup> The John A. Hartford Foundation and Institute for Healthcare Improvement Age-

**Table 4** Common Foot Problems Detected on Examination and Recommended Treatments and Referral Pathways<sup>42</sup>

| Foot Disorder                                    | Therapeutic Interventions/Indicated Referrals   | Urgency of Treatment/Referral                          |
|--|---|--|
| <b>Nail disorders</b>                            |   |  |
| Ingrown toenails                                 | Shoes with wider toe box<br>Podiatry referral for avulsion or matricectomy  | Routine unless associated skin breakdown or ulceration |
| Onychomycosis/fungal nail infection              | Prolonged topical or oral antifungal therapy<br>Podiatry referral   | Routine unless widespread infection                    |
| <b>Skin disorders</b>                            |   |  |
| Pigmented lesion concerning for neoplasm         | Dermatology referral  | Urgent   |
| Ulcer  | Podiatry referral   | Urgent   |
| Xerosis  | Topical emollient<br>Urea cream (10%, 20%, or 40%)<br>Ammonium lactate cream (12%)<br>Podiatry referral   | Routine  |
| Hyperkeratosis (including calluses and corns)    | Shoe inserts if related to fat pad atrophy<br>Orthoses<br>Podiatry referral for debridement   | Routine  |
| <b>Bone/joint disorders</b>                      |   |  |
| Foot pain or arthritis                           | Orthotics<br>Prescription shoes<br>Corticosteroid injections<br>Exercise/stretching therapies<br>Podiatry or orthopedic surgery referral<br>Physiatry referral<br>Physical therapy referral | Routine  |
| Hallux valgus                                    | Shoes with wider toe box<br>Orthoses<br>Referral to podiatry or orthopedic surgery if surgical correction considered  | Routine  |
| Hallux limitus/rigidus                           | Foot radiographs<br>Referral to podiatry or orthopedic surgery if surgical correction considered  | Routine  |
| Hammertoes                                       | Shoes with wider, higher toe box<br>Prescription shoes<br>Orthoses<br>Podiatry or orthopedic surgery referral if debridement or surgical correction considered                              | Routine unless associated wounds or pressure injury    |
| Pes cavus/planus                                 | Orthoses<br>Podiatry referral   | Routine  |
| Plantar fasciitis/heel pain                      | Stretching exercises<br>Physical therapy<br>Orthoses<br>Steroid injection<br>Physiatry referral<br>Podiatry or orthopedic surgery referral  | Routine  |
| <b>Neurovascular disorders</b>                   |   |  |
| Clinical evidence of peripheral arterial disease | Ankle brachial indices<br>Podiatry referral<br>Vascular surgery referral  | Urgent   |
| Impaired light touch sensation                   | Neuropathy workup<br>Podiatry referral  | Urgent   |

Friendly Health Systems Initiative also identifies “Mobility” as a domain in their “4Ms” framework. The concise foot examination described here should be included under the “Mobility” domain. Miller et al previously described a

“3-minute diabetic foot exam” to streamline the process for detecting diabetic foot pathology.<sup>39</sup> Here we describe a method for foot examination that focuses on issues relevant to foot care for older adults.

## METHODS

### Foot Examination for Older Adults

This examination includes a focused history and physical examination (Table 2).<sup>40</sup> It does not require any specialized equipment and can be incorporated into a patient evaluation in any clinical setting. Following completion of the physical examination, if feasible and appropriate, there is an opportunity for brief education on foot care for the patient or their caregiver (Table 3).<sup>41</sup> The history and inspection components of this examination could be performed using telehealth.<sup>42</sup>

## RESULTS

### “No Further Falls”: Case Study Continued

The interprofessional team devised a falls prevention plan for the patient. A referral to physical therapy was made. A life alert device was ordered and a medication review was performed. The plan also included referral to a podiatrist. His toenails were cut and debrided and an emollient was prescribed for treatment of xerotic skin. Education on foot care and appropriate footwear (extra depth and extra width) was provided. At his next clinic visit 3 months later, the patient reported that he had not fallen since.

### Treatment

A referral to podiatry or other services may be indicated if there are abnormal findings on examination (Table 4).<sup>43</sup>

Urgent referral to podiatry is indicated if ulcers are detected or if there is concern for skin, soft tissue, bone, or widespread nail infection. Assessment by a podiatrist can assist in confirming the correct diagnosis and managing many foot and ankle pathologies.<sup>44</sup>

Detection of foot problems, referral to podiatry, and provision of appropriate footwear have been shown to reduce the incidence of falls.<sup>45,46</sup> A 2019 meta-analysis of community and older adults dwelling in nursing homes (n = 6502) investigated the effect of multicomponent podiatry interventions on falls incidence. The study found a significant reduction in rate of falls (rate ratio: 0.73 [95% CI 0.54-0.98]).<sup>47</sup>

In the United States, certain podiatric services are covered by Medicare (Part B). If the required service is covered, 80% will be paid by Medicare and 20% by the patient. Patients with higher-risk conditions such as diabetes and peripheral arterial disease are eligible for a greater range of podiatry services, including routine foot care. Therapeutic shoes may also be covered for patient with diabetes. Treatment for fungal nail disorders is covered if there is clinical evidence of infection noted during physical examination and associated pain, secondary infection, or mobility impairment.<sup>48</sup>

Increased access to routine foot care and therapeutic shoes under Medicare for older patients may aid in improving overall foot health in this population and potentially reduce foot pain and mobility impairments. This would also

be in keeping with the White House Conference on Aging recommendations on foot care.<sup>7</sup>

The findings on examination may also prompt a referral to orthopedic surgery for further assessment, particularly if foot and ankle bone and joint issues are identified. A previous study of the prevalence of foot pathology in older adults (n = 784) in the United States found that 15% had ankle pain and 40% had tenderness on foot examination. Furthermore, 60% had a lesser toe deformity and 37% were found to have a hallux valgus.<sup>24</sup> Patients with lower extremity bone and joint disorders may also benefit from referral to psychiatry, orthotics, or physical therapy. Occupational therapy assessment can assist in providing adaptive devices for foot care such as sock donning devices and long shoe horns.

### Prognosis

Maintaining optimal foot health results in overall improved health and quality of life and reduces complications of chronic conditions such as diabetes and peripheral arterial disease.<sup>49,50</sup>

## CONCLUSIONS

The foot examination is an important component of any comprehensive assessment of an older adult and as part of a falls assessment.

This focused foot examination technique for older and frail adults can be easily performed in any inpatient, outpatient, or long-term care setting. Suboptimal foot care and long toenails may be an indicator of deteriorating functional status or a caregiver's inability to complete all aspects of care.<sup>26</sup> Completion of this focused foot examination can aid in detection of an older adult with declining function or emerging frailty and can prompt interventions to improve foot care and potentially prevent adverse outcomes.

## References

1. Feddock CA. The lost art of clinical skills. *Am J Med* 2007;120(4):374–8.
2. Sharma S. A single-blinded, direct observational study of PGY-1 interns and PGY-2 residents in evaluating their history-taking and physical-examination skills. *Perm J* 2011;15(4):23–9.
3. Korda J, Bálint GP. When to consult the podiatrist. *Best Pract Res Clin Rheumatol* 2004;18(4):587–611.
4. Corbett E, Whitcomb M. *The AAMC Project on the Clinical Education of Medical Students: Clinical Skills Education*. Washington, DC: Association of American Medical Colleges; 2004.
5. Gawande A. *Being Mortal: Medicine and What Matters in the End*. New York, NY: Metropolitan Books; 2014.
6. Bean WB. *Sir William Osler: Aphorisms From His Bedside Teachings and Writings*. New York, NY: Schuman; 1950.
7. *Final report, the 1981 White House Conference on Aging*. Washington, DC: The Conference; 1981.
8. Menz HB. Biomechanics of the ageing foot and ankle: a mini-review. *Gerontology* 2015;61(4):381–8.
9. Thomas MJ, Roddy E, Zhang W, Menz HB, Hannan MT, Peat GM. The population prevalence of foot and ankle pain in middle and old age: a systematic review. *Pain* 2011;152(12):2870–80.
10. Singhal A, Segal AR, Munshi MN. Diabetes in long-term care facilities. *Curr Diab Rep* 2014;14(3):464.

11. Meijer WT, Hoes AW, Rutgers D, Bots ML, Hofman A, Grobbee DE. Peripheral arterial disease in the elderly: The Rotterdam Study. *Arterioscler Thromb Vasc Biol* 1998;18(2):185–92.
12. Thomas JL, Christensen JC, Kravitz SR, et al. The diagnosis and treatment of heel pain: a clinical practice guideline-revision 2010. *J Foot Ankle Surg* 2010;49(3 Suppl):S1–S19.
13. Evans PL, Prior JA, Belcher J, Mallen CD, Hay CA, Roddy E. Obesity, hypertension and diuretic use as risk factors for incident gout: a systematic review and meta-analysis of cohort studies. *Arthritis Res Ther* 2018;20(1):136.
14. Robbins JM, Strauss G, Aron D, Long J, Kuba J, Kaplan Y. Mortality rates and diabetic foot ulcers: is it time to communicate mortality risk to patients with diabetic foot ulceration? *J Am Podiatr Med Assoc* 2008;98(6):489–93.
15. Menz HB, Auhl M, Spink MJ. Foot problems as a risk factor for falls in community-dwelling older people: a systematic review and meta-analysis. *Maturitas* 2018;118:7–14.
16. Summary of the Updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons. *J Am Geriatr Soc* 2011;59(1):148–57.
17. Barr EL, Browning C, Lord SR, Menz HB, Kendig H. Foot and leg problems are important determinants of functional status in community dwelling older people. *Disabil Rehabil* 2005;27(16):917–23.
18. Schwartz AW. What Van Halen can teach us about the care of older patients. *JAMA Intern Med*. 2017;177(3):309–10.
19. 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(12):1651–6.
20. Ebrahim SB, Sainsbury R, Watson S. Foot problems of the elderly: a hospital survey. *Br Med J (Clin Res Ed)* 1981;283(6297):949–50.
21. White EG, Mulley GP. Footcare for very elderly people: a community survey. *Age Ageing* 1989;18(4):276–8.
22. Benvenuti F, Ferrucci L, Guralnik JM, Gangemi S, Baroni A. Foot pain and disability in older persons: an epidemiologic survey. *J Am Geriatr Soc* 1995;43(5):479–84.
23. Growdon ME, Schwartz A, James K. Identifying and overcoming barriers to gait speed and foot assessments in a multidisciplinary geriatrics consult clinic. *J Am Geriatr Soc* 2019;67:S202.
24. Dunn JE, Link CL, Felson DT, Crincoli MG, Keysor JJ, McKinlay JB. Prevalence of foot and ankle conditions in a multiethnic community sample of older adults. *Am J Epidemiol* 2004;159(5):491–8.
25. Campbell J, Patterson A, Gregory D, et al. What happens when older people are discharged from NHS podiatry services? *The Foot* 2002;12(1):32–42.
26. Orkaby AR, Schwartz AW. Toenails as the "hemoglobin A1c" of functional independence-beyond the polished wingtips. *JAMA Intern Med* 2018;178(5):598–9.
27. Zaiac MN, Walker A. Nail abnormalities associated with systemic pathologies. *Clin Dermatol* 2013;31(5):627–49.
28. Munshi M, Grande L, Hayes M, et al. Cognitive dysfunction is associated with poor diabetes control in older adults. *Diabetes Care* 2006;29(8):1794–9.
29. Chantelau E, Gede A. Foot dimensions of elderly people with and without diabetes mellitus - a data basis for shoe design. *Gerontology* 2002;48(4):241–4.
30. Reiber GE. Who is at risk of limb loss and what to do about it? *J Rehabil Res Dev* 1994;31(4):357–62.
31. Menz HB, Morris ME. Footwear characteristics and foot problems in older people. *Gerontology* 2005;51(5):346–51.
32. Buldt AK, Menz HB. Incorrectly fitted footwear, foot pain and foot disorders: a systematic search and narrative review of the literature. *J Foot Ankle Res* 2018;11:43.
33. Kelsey JL, Procter-Gray E, Nguyen US, Li W, Kiel DP, Hannan MT. Footwear and falls in the home among older individuals in the MOBILIZE Boston Study. *Footwear Sci* 2010;2(3):123–9.
34. Munro BJ, Steele JR. Foot-care awareness. A survey of persons aged 65 years and older. *J Am Podiatr Med Assoc* 1998;88(5):242–8.
35. Lee R. The CDC's STEADI Initiative: promoting older adult health and independence through fall prevention. *Am Fam Physician* 2017;96(4):220–1.
36. Markinson BC. Three-step approach to in-office assessment of the geriatric foot. *Geriatrics* 2001;56(11):48–52 [quiz 5].
37. Helfand AE. Podiatric assessment of the geriatric patient. *Clin Podiatr Med Surg* 2003;20(3):407–29.
38. Tinetti M, Huang A, Molnar F. The geriatrics 5M's: a new way of communicating what we do. *J Am Geriatr Soc* 2017;65(9):2115.
39. Miller JD, Carter E, Shih J, et al. How to do a 3-minute diabetic foot exam. *J Fam Pract* 2014;63(11):646–56.
40. Rayman G, Vas PR, Baker N, et al. The Ipswich Touch Test: a simple and novel method to identify inpatients with diabetes at risk of foot ulceration. *Diabetes Care* 2011;34(7):1517–8.
41. Centers for Disease Control and Prevention. Diabetes and your feet. Available from: <https://www.cdc.gov/diabetes/library/features/healthy-feet.html>. Accessed May 9, 2020.
42. Corcoran H, Hui E, Woo J. The acceptability of telemedicine for podiatric intervention in a residential home for the elderly. *J Telemed Telecare* 2003;9(3):146–9.
43. Fillit HM, Rockwood K, Young JB. *Brocklehurst's Textbook of Geriatric Medicine and Gerontology E-Book*. Elsevier Health Sciences; 2016.
44. Bonanno DR, Medica VG, Tan DS, Spring AA, Bird AR, Gazarek J. Evaluating the outcomes of a podiatry-led assessment service in a public hospital orthopaedic unit. *J Foot Ankle Res* 2014;7(1):45.
45. Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev* 2012(9):CD007146.
46. Arnadottir SA, Mercer VS. Effects of footwear on measurements of balance and gait in women between the ages of 65 and 93 years. *Phys Ther* 2000;80(1):17–27.
47. Wylie G, Torrens C, Campbell P, et al. Podiatry interventions to prevent falls in older people: a systematic review and meta-analysis. *Age Ageing* 2019;48(3):327–36.
48. Centers for Medicare & Medicaid Services. Medicare benefit policy manual, chapter 15—covered medical and other health services. 2012;14:2013.
49. Mayfield JA, Reiber GE, Sanders LJ, Janisse D, Pogach LM. Preventive foot care in people with diabetes. *Diabetes Care* 1998;21(12):2161–777.
50. Lopez-Lopez D, Exposito-Casabella Y, Losa-Iglesias M, Bengoa-Vallejo RB, Saleta-Canosa JL, Alonso-Tajes F. Impact of shoe size in a sample of elderly individuals. *Rev Assoc Med Bras (1992)* 2016;62(8):789–94.