Research Square

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Does the shoe really fit? Characterising ill-fitting footwear among community dwelling older adults: an observational cross-sectional study

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Abstract

Background Falls in older people are common and can result in loss of confidence, fear of falling, restriction in activity and loss of independence. Causes of falls are multi-factorial and include extrinsic factors such as unsafe footwear. Inappropriate footwear may increase the risk of falls. There is a paucity of research assessing the footwear characteristics among older people who are at high risk of falls, internationally and in the Irish setting. The aim of this study was to examine the proportion of older adults attending a geriatric day hospital in Ireland who were wearing incorrectly sized shoes. Methods A consecutive sample of 111 older adults aged 60 years and over attending a geriatric day hospital in a large Irish teaching hospital was recruited. Demographic data including age, mobility, medications, use of glasses, social support, footwear worn at home and falls history were recorded. Shoe size and foot length were measured in millimetres using an internal shoe gauge and SATRA shoe size stick, respectively. Subjects' self-reported shoe size was recorded. Footwear was assessed using the Footwear Assessment Form (FAF). A Timed Up and Go (TUG) score was recorded. Participation was assessed using the Nottingham Extended Activities of Daily Living (NEADL) Scale. Those with shoes fitting on at least one foot were compared to those with ill-fitting footwear on both feet using Chi-square tests, T-tests or Mann–Whitney U tests. Results 72% of participants were wearing footwear that did not fit correctly on both feet according to our definition based on previous literature. Only 6% were wearing footwear that fitted correctly on both feet. 67% wore slippers at home. 90% had shoes with smooth, partly worn or fully worn sole treading. Participant age, TUG score and NEADL score were not associated with ill-fitting footwear. Conclusions Wearing incorrectly fitting shoes and shoes with unsafe features is common among older adults attending geriatric day services. The large number of participants who reported wearing slippers at home is also an important finding. Ill-fitting footwear and slippers are risk factors for falls thus warranting further investigation to help guide future falls prevention services at day hospitals.

Background

Over 7,000 older adults are admitted to Irish hospitals with a fall annually [1]. Falls and fall-related fractures are a major risk to older people as well as being a huge cost to society [2], with nearly one in three community-dwelling older adults falling annually [3]. Falls can cause serious injury resulting in disability, nursing home admission and death [4]. Even when there is no serious injury, falls impact on the individual, resulting in loss of confidence, fear of falling, restriction in activity and a decreased quality of life [5]. The causes of falls in older people are multifactorial, including poor lower limb proprioception, visual impairment, side-effects of psychoactive medications, decreased reaction time and decreased lower limb muscle strength [6, 7]. In addition to these intrinsic factors, it has been suggested that falls may also be caused by extrinsic factors such as environmental hazards and unsafe footwear [8, 9]. Inappropriate footwear refers to both particular types of footwear with unsafe features, as described in the FAF, and also footwear of an incorrect size. Wearing inappropriate footwear has been associated with falls [10]. Over half of the older participants in the MOBILIZE Boston Study were wearing slippers, barefoot or socks without shoes when they experienced an in-home fall [11]. A recent systematic review found inadequate evidence linking particular footwear styles with falls among older adults [12], however, trip-

related falls may be linked to wearing slippers or ill-fitting shoes without proper fixation in an older population [13]. A shoe's material and tread design can affect the coefficient of friction on the walking surface, which may influence the risk of slipping [14, 15]. Thin, hard-soled footwear with high collars are advised to reduce the risk of falling [16]. Heel height and width may affect a shoe's tendency to tip sideways on an uneven surface, as well as gait and posture [6, 17]. High-heeled shoes have been linked to impaired balance in older people [13, 18]. The characteristics of footwear among older people who are at high risk of falls has been less studied. As footwear worn by a population is a contextual and cultural phenomenon it is therefore necessary to establish the proportion in Ireland.

Methods

Aim

The aim of this study was to examine the proportion of older individuals attending a geriatric day hospital who were wearing incorrectly sized shoes. A secondary aim was to determine the characteristics of footwear worn by this population.

Design

This was an observational cross-sectional study.

Subjects

A consecutive series of older individuals presenting as outpatients to a geriatric day hospital of an acute general teaching hospital were invited to participate in the study. Recruitment took place between June - July 2017. Participants were included if they were aged over 60 years, were attending the geriatric day hospital, agreed to participate in the study, were able to stand independently and had the ability to understand simple instructions so as to allow completion of assessments. The senior physiotherapist in the day hospital acted as a gatekeeper. Participants deemed to be eligible were invited to take part in the study and provided with an information leaflet, and gave written informed consent. The study was approved by the hospital's Research Ethics Committee.

Procedure

Subject characteristics

Information on age, level of mobility, use of glasses and social support was determined from participant self-reporting and medications were recorded from participant medical records. The definition used for polypharmacy was five or more medications daily, in line with the majority of recent research [19]. Participants were also asked if they had fallen at any time in the past month and/or in the past six months. A 'Timed Up and Go' (TUG) score [20] was retrieved from the physiotherapy department records if available, and current participation levels were assessed through interview with participants using the Nottingham Extended Activities of Daily Living (NEADL) Scale [21].

Fit of Footwear

The definition used in this study for correctly fitting shoe size was taken from the work by Chantelau and Gede [22]. They describe the need for a gap of 10 to 15mm between the toes and the anterior of the shoe to allow "extra space for the toes when extending during walking and standing" [22]. A similar measure of “approximately 1.5cm between the hallux and the shoe end” was used by Menant et al [13]. The primary outcome was the difference between the foot and shoe length. The secondary outcome was the proportion of participants whose foot to shoe length difference was outside the 10 to 15mm range. Foot and footwear assessments were administered in a quiet, bright physiotherapy treatment room by a student physiotherapist who had received specific training. A pilot study was conducted in the first week of the study to ensure standardised foot and footwear measurement.

Foot measurements

Both feet of each participant were measured in millimetres using a SATRA shoe size stick. Each participant stood barefoot and relaxed, with the feet slightly apart and with the weight evenly distributed between both feet. The fixed anvil of the SATRA shoe size stick (Figure 1a) was placed behind the heel of the foot being measured with the researcher firmly holding the subject’s ankle and device together. The researcher then moved the sliding caliper up to the longest toe and noted the foot length indicated. It is important to note that the longest toe was not necessarily the first toe. The same procedure was repeated for the other foot. The participant’s self-reported shoe size was also recorded.

Footwear measurements

The subject’s footwear was placed on a firm level surface. A calibrated Internal Shoe Size Gauge® (SATRA, UK) was then placed into the shoe and the flat bar of the device pushed into the shoe until it clearly contacted the end of the toe box (Figure 1b). The slide of the device was then adjusted until the rear curved bar section touched the heel of the shoe. The internal length of the shoe was recorded in mm. The same procedure was then repeated for the other shoe.

Footwear assessment

Footwear was assessed using the Footwear Assessment Form (FAF), which is a reliable tool for the assessment of shoe style, heel height, fixation, heel counter stiffness, longitudinal sole rigidity, sole flexion point, tread pattern and sole hardness [23].

Statistical analyses

The difference between foot length and internal shoe-length was calculated in mm. The proportion (with 95% confidence intervals) of participants whose foot to shoe length difference was outside the 10 to 15mm range was calculated. Those with shoes fitting on at least one foot were compared to those with ill-fitting footwear on both feet using the Chi-square test for categorical variables and the T-test or Mann–

Whitney U test for continuous variables depending on normality. Statistical analyses were carried out using SPSS 16.

Results

Participant characteristics

A total of 133 participants were screened, 2 declined to participate and 111 participants were assessed. There were 44 males and 67 females assessed with a mean age of 81.6 years (range 63–99, SD=7.5). The median participant TUG score was 20 seconds (IQR=16-25.7). The majority of participants were living in the community and used a mobility aid. A walking aid was used by 80% (n=89) of participants, 43% (n=48) reported living alone and 94% (n=104) reported wearing reading glasses. Over two-thirds (67% (n=74)) reported wearing slippers at home. Close to half of participants (51% (n=57)) reported having fallen in the last 6 months. A large proportion (87% (n=96)) were taking 5 or more medications.

Footwear characteristics

Table 1 describes the characteristics of shoes worn by the participants. The median UK shoe size for males was a size 9 and for females it was a size 6. On the day of assessment the majority, 59% of men (n=44) and 46% women (n=67), wore a walking style shoe. Table 1 shows the distribution of other shoe types by gender.

Two–thirds of participants (67%, n=74) reported that they wore slippers at home. According to the Footwear Assessment Scale no participants' shoes had 5 or more unsafe features, however, there were several features associated with unsafe shoes noted: 26% (n=29) had shoes with no fixation, 63% (n=70) had shoes with a Heel Counter Stiffness >45˚, 81% had shoes with a longitudinal sole rigidity >45˚ and 90% (n=100) of participants had smooth, partly worn or fully worn sole treading on their shoes. A third of participants (34%), had a difference between their self reported shoe size and the actual size of shoes they were wearing.

Only 6% (n=7) (95% CI 3%-12%) were defined as having shoes correctly fitting on both feet. Correctly fitting shoes on at least one foot was identified in 28% (n=31) of participants (95% CI 20%-37%). Almost three quarters (72%, n=80) were defined as having incorrectly fitting shoes on both feet, i.e. outside the 10-15mm range. Of those wearing ill-fitting shoes on both feet (n=80), 67.5% of these 80 participants had a left shoe size difference of greater than 5mm above or below the gap allowed of 10-15mm, and 60% of these had a right shoe size difference greater than 5mm above or below this allowed gap. Table 2 compares participants who were wearing correctly fitting shoes and ill-fitting shoes. There was no significant difference in falls history or functional ability between the two groups.

Discussion

Summary of findings in context of other literature

To the knowledge of the authors, this is the largest study to date to estimate the proportion of older adults attending a geriatric day hospital who were wearing inappropriate shoes. Most participants were wearing footwear that could be described as inappropriate as it was either ill-fitting or had unsafe features. We found a large cohort of older people to be wearing footwear of incorrect length on both feet. This is consistent with previous studies where an older population has been identified as wearing ill-fitting footwear [24-27]. This may put these individuals at risk of trip-related falls [13]. Furthermore, the majority of participants were wearing footwear with several unsafe features including shoes with a heel counter stiffness greater than 45˚, shoes with a longitudinal sole rigidity greater than 45˚ and shoes that had smooth, partly worn or fully worn sole tread pattern. However, this study did not find a significant difference in recent falls history between those wearing shoes that fit correctly and those who wore ill-fitting shoes. This is a vulnerable group of older adults considering that 94% wear reading glasses, 80% use a walking aid, 87% are on polypharmacy and with an average age of 82 years. The very high rate of ill-fitting footwear identified in this population is striking both because they are a high-risk group, and also because they are a group that has contact with healthcare professionals, receiving regular advice from doctors, physiotherapists and occupational therapists.

Previous footwear studies have identified the difficulty in convincing older adults to purchase appropriate footwear through educational interventions [28]. However, advice and education from health professionals as a behavioural change intervention has been shown to be effective in other healthcare issues such as smoking cessation [29]. Further research into current footwear education interventions being provided to older adults and its effectiveness is warranted. The footwear patterns and level of awareness of footwear are unknown among community-dwelling older adults of the same age who are not actively in contact with healthcare professionals. To the knowledge of the authors there are no are no recent studies investigating footwear patterns and level of awareness of footwear among this population and this is an area for further research.

Previous literature has identified the importance of footwear interventions in preventing falls in older adults as part of a multi-faceted podiatry approach [30, 31]. Interventions including advice and information and provision of footwear or orthotics as required have a positive effect on balance in older adults in the community. The finding in our study that the majority of older adults wore ill-fitting footwear supports the claim that a podiatric intervention service would be beneficial to older adults.

The large number of participants who reported wearing slippers at home was an important finding as slippers may be a risk for falls in an older population [10, 11, 13]. The main reasons for selection of footwear for indoor use by older adults have been identified as comfort and low cost, and indoor footwear is also rarely replaced [28]. This method for choosing footwear appears to be consistent with the findings in this study and may contribute to risks of falling for older adults at home. Advice regarding safe and appropriate footwear may be a useful intervention to address this risk and an area for further research.

Strengths and limitations

A limitation of this study was the lack of follow up with participants due to the cross-sectional study design. It may have been beneficial to perform assessments of other measures, including balance tests in their footwear, which may have revealed other differences. It is unknown if the physical measure used was associated with the footwear assessed as the TUG and footwear assessment were not carried out on the same day. We did not measure the width of participant's shoes or feet during this study and thus we are unable to determine whether participants were wearing shoes that were too narrow or too wide for their feet. We were unable to assess the shoes or slippers worn at home by the participants, as we only assessed the shoes that were worn into the day hospital on the day of assessment. In addition, it was not identified if the shoes that were examined in the study were worn when these participants had falls.

Implications for future research and practice

Older adults in Ireland who are aged over 65 years make up just over 12% of the population and this number is expected to increase in coming years [32]. Therefore preventative services are and will continue to be vital to protect the welfare and safety of the ageing population. The wearing of incorrectly fitting shoes is also strongly associated with pathology of the forefoot and with foot pain [25, 27]. The assessment of such conditions was outside the scope of this study but is an area that should be explored in future research. Further investigation in a large prospective study is warranted to help guide future falls prevention services at day hospitals. There is a need for a routine uncomplicated assessment of footwear for older adults, which could help to prevent foot disorders and reduce the risk of falls.

CONCLUSION

It appears to be common among older adults to wear incorrectly fitting shoes. Wearing slippers at home also seems to be a common occurrence among this population. Ill-fitting footwear and slippers are risk factors for falls. A better understanding of falls risk, in particular issues relating to appropriate footwear can be used to inform and enhance falls rehabilitation programmes. This study will help guide future falls prevention services for footwear screening in geriatric daycare services. These findings would offer benefit to future participants in relation to addressing falls prevention and the need for interventions specific to footwear advice, education and remediation.

List Of Abbreviations

FAF: Footwear Assessment Form

NEADL: Nottingham Extended Activities of Daily Living Scale

TUG: Timed Up and Go

Key Points

· It is common among older adults attending a day hospital to wear ill-fitting shoes

· A large proportion of older adults report wearing slippers in their own homes

· There is need for interventions for older adults specific to footwear advice, education and remediation

Declarations

Ethics Approval And Consent To Participate

The study received ethical approval by the St. James's Hospital and Tallaght University Hospital Joint Research and Ethics Committee. All participants provided written informed consent.

Consent For Publication

N/A

Availability Of Data And Material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests

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Author's Contributions

NFH and CC conceptualised the study, NM and BC were involved in participant recruitment and administration of the study, BOR, RB and SV collected the data, BOR and MEW analysed the data, NFH, BOR and MEW interpreted the results, BOR wrote the original draft and MEW, NM, CC and NFH contributed to the editing and reviewing of the paper. All authors reviewed and approved the final manuscript.

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References

1. Gannon B, O'Shea E, Hudson E. The economic costs of falls and fractures in people aged 65 and over in Ireland technical report to NCAOP/HSE/DOHC. Health Service Executive (HSE), 2007.

2. Iglesias C, Manca A, Torgerson D. The health related quality of life and cost implications of falls in elderly women. Osteoporosis Int. 2009;20(6):869-78.

3. Gill T, Taylor AW, Pengelly A. A population-based survey of factors relating to the prevalence of falls in older people. Gerontology. 2005;51(5):340-5.

4. Centers for Disease Control and Prevention. Fatalities and Injuries From Falls Among Older Adults—United States, 1993-2003 and 2001-2005. JAMA. 2007;297(1):32-3.

5. Tinetti ME, Baker DI, McAvay G, Claus EB, Garrett P, Gottschalk M, et al. A multifactorial intervention to reduce the risk of falling among elderly people living in the community. N Engl J Med. 1994;331(13):821-7.

6. Lord SR, Bashford GM. Shoe characteristics and balance in older women. J Am Geriatr Soc. 1996;44(4):429-33.

7. Menz HB, Lord SR. Footwear and postural stability in older people. J Am Podiatr Med Assoc. 1999;89(7):346-57.

8. Dyer CA, Watkins CL, Gould C, Rowe J. Risk-factor assessment for falls: from a written checklist to the penless clinic. Age Ageing. 1998;27(5):569-72.

9. Frey C, Kubasak M. Faulty footwear contributes to why seniors fall. Biomechanics. 1998;5:45-7.

10. Sherrington C, Menz HB. An evaluation of footwear worn at the time of fall-related hip fracture. Age Ageing. 2003;32(3):310-4.

11. Kelsey JL, Berry SD, Procter-Gray E, Quach L, Nguyen US, Li W, et al. Indoor and outdoor falls in older adults are different: the maintenance of balance, independent living, intellect, and Zest in the Elderly of Boston Study. J Am Geriatr Soc. 2010;58(11):2135-41.

12. Davis A, Haines T, Williams C. Do footwear styles cause falls or increase falls risk in healthy older adults? A systematic review. Footwear Sci. 2019;11(1):13-23.

13. Menant JC, Steele JR, Menz HB, Munro BJ, Lord SR. Effects of footwear features on balance and stepping in older people. Gerontology. 2008;54(1):18-23.

14. Chaffin DB, Woldstad JC, Trujillo A. Floor/shoe slip resistance measurement. Am Ind Hyg Assoc J. 1992;53(5):283-9.

15. Wilson M. “Development of SATRA Slip Test and Tread Pattern Design Guidelines.” In Slips, Stumbles, and Falls: Pedestrian Footwear and Surfaces, edited by B. E. Gray, 113–123. Philadelphia, PA: ASTM. 1990.

16. Aboutorabi A, Bahramizadeh M, Arazpour M, Fadayevatan R, Farahmand F, Curran S, et al. A systematic review of the effect of foot orthoses and shoe characteristics on balance in healthy older subjects. Prosthet Orthot Int. 2016;40(2):170-81.

17. Snow RE, Williams KR. High heeled shoes: their effect on center of mass position, posture, three-dimensional kinematics, rearfoot motion, and ground reaction forces. Arch Phys Med Rehabil. 1994;75(5):568-76.

18. Tencer AF, Koepsell TD, Wolf ME, Frankenfeld CL, Buchner DM, Kukull WA, et al. Biomechanical properties of shoes and risk of falls in older adults. J Am Geriatr Soc. 2004;52(11):1840-6.

19. Masnoon N, Shakib S, Kalisch-Ellett L, Caughey GE. What is polypharmacy? A systematic review of definitions. BMC Geriatr. 2017;17:230.

20. Podsiadlo D, Richardson S. The timed "Up & Go": a test of basic functional mobility for frail elderly persons. J Am Geriatr Soc. 1991;39(2):142-8.

21. Nouri F, Lincoln N. An extended activities of daily living scale for stroke patients. Clin Rehabil. 1987;1(4):301-5.

22. 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.

23. Menz HB, Sherrington C. The Footwear Assessment Form: a reliable clinical tool to assess footwear characteristics of relevance to postural stability in older adults. Clin Rehabil. 2000;14(6):657-64.

24. Burns SL, Leese GP, McMurdo ME. Older people and ill fitting shoes. Postgrad Med J. 2002;78(920):344-6.

25. Menz HB, Morris ME. Footwear characteristics and foot problems in older people. Gerontology. 2005;51(5):346-51.

26. Nixon BP, Armstrong DG, Wendell C, Vazquez JR, Rabinovich Z, Kimbriel HR, et al. Do US veterans wear appropriately sized shoes?: the Veterans Affairs shoe size selection study. J Am Podiatr Med Assoc. 2006;96(4):290-2.

27. 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.

28. Spink MJ, Menz HB, Fotoohabadi MR, Wee E, Landorf KB, Hill KD, et al. Effectiveness of a multifaceted podiatry intervention to prevent falls in community dwelling older people with disabling foot pain: randomised controlled trial. BMJ. 2011;342:d3411.

29. Jepson RG, Harris FM, Platt S, Tannahill C. The effectiveness of interventions to change six health behaviours: a review of reviews. BMC Public Health. 2010;10:538.

30. Cockayne S, Adamson J, Clarke A, Corbacho B, Fairhurst C, Green L, et al. Cohort Randomised Controlled Trial of a Multifaceted Podiatry Intervention for the Prevention of Falls in Older People (The REFORM Trial). PLoS One. 2017;12(1):e0168712.

31. Wylie G, Torrens C, Campbell P, Frost H, Gordon AL, Menz HB, et al. Podiatry interventions to prevent falls in older people: a systematic review and meta-analysis. Age Ageing. 2019;48(3):327-36.

32. Central Statistics Office. Census of Population 2016 - Profile 3 An Age Profile of Ireland. [online]. Available at: https://www.cso.ie/en/releasesandpublications/ep/p-cp3oy/cp3/agr/ [Accessed 6 May 2019]. 2016.

Tables

Table 1: Characteristics of shoes worn by participants

	Male (n=44)	Female (n=67)	Total (n=111)
	Right (SD) : Left (SD)	**Right (SD) : Left (SD)**	**Right (SD) : Left (SD)**
Mean Foot Length mm	264.3 (18.3) : 264.3 (18.9)	236.9 (18.3) : 236.3 (19)	247.7 (18.3) : 247.4 (18.9)
Mean Internal Shoe Size	283 (19.2) : 283 (19.2)	255.1 (19.3) : 255.2 (19.2)	266.1 (19.2) : 266.2 (19.1)
Mean difference between foot and shoe length	18.8 (10) : 18.7 (10.4)	18.6 (9.95) : 19.4 (10.3)	18.4 (9.9) : 18.8 (10.3)
	n (%)	**n (%)**	**n (%)**
Shoes Fitting on both feet	3 (7)	4 (6)	7 (6)
Shoes Fitting on at least one foot	14 (32)	17 (25)	31 (28)
Shoes incorrectly fitting	30 (68)	50 (75)	80 (72)
Shoes with no fixation	8 (18)	21 (31)	29 (26)
Heel Counter Stiffness >45	25 (57)	45 (67)	70 (63)
Longitudinal Sole Rigidity >45	34 (77)	56 (85)	90 (81)
Sole Flexion Point not at MTPJs	3 (7)	5 (7)	8 (7)
Smooth, partly worn or fully worn sole	42 (95)	58 (87)	100 (90)
Shoe Type:			
Walking Shoes	26 (23)	31 (28)	57 (51)
Sandals	3 (3)	14 (13)	17 (15)
Athletic Shoes	4 (4)	6 (5)	10 (9)
Moccasins	2 (2)	6 (5)	8 (7)
Court Shoes	0 (0)	3 (3)	3 (3)
Oxford Shoes	5 (5)	1 (1)	6 (5)
Slippers	2 (2)	3 (3)	5 (5)
Other	2 (2)	3 (3)	5 (5)

Table 2: Comparison of Participants with Correctly fitting and Ill-fitting shoes

	Shoes Fitting on Both feet or 1 foot n=31 *n (%)*	*Shoes Not Fitting on both feet n=80* *n (%)*	*Test*	*P-value*
Female	17 (55)	50 (62.5)	Chi^2	0.46
Using Walking Aid	23 (74)	66 (83)	Chi^2	0.33
Falls in last 6 months	12 (39)	45 (56)	Chi^2	0.09
Falls in last 1 month	5 (16)	19 (24)	Chi^2	0.38
Lives Alone	12 (39)	36 (45)	Chi^2	0.55
Mean Age (SD) years	82.2 (±7.4)	81.4 (±7.5)	T-Test	0.63
NEADL Independent Mean Score out of 22. (SD)	13.1 (±4.8)	12.6 (±4.5)	T-Test	0.57
TUG Median Score seconds (IQR)	20 (16-25.7)*	20 (14.5-30)**	Mann-Whitney U Test	0.20

*based on TUG scores obtained of 25 out of 31 participants

** based on TUG scores obtained of 67 out of 80 participants

Figures

Figure 1a: SATRA shoe size stick

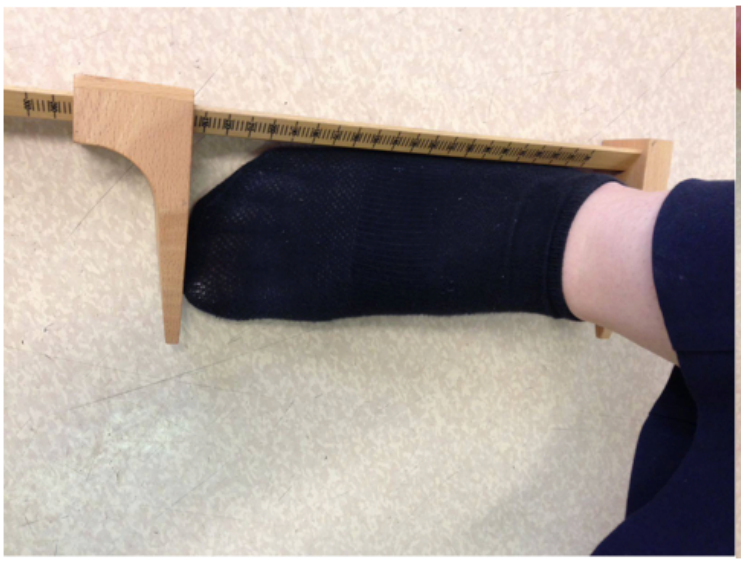

Figure 1b: Internal Shoe Size Gauge

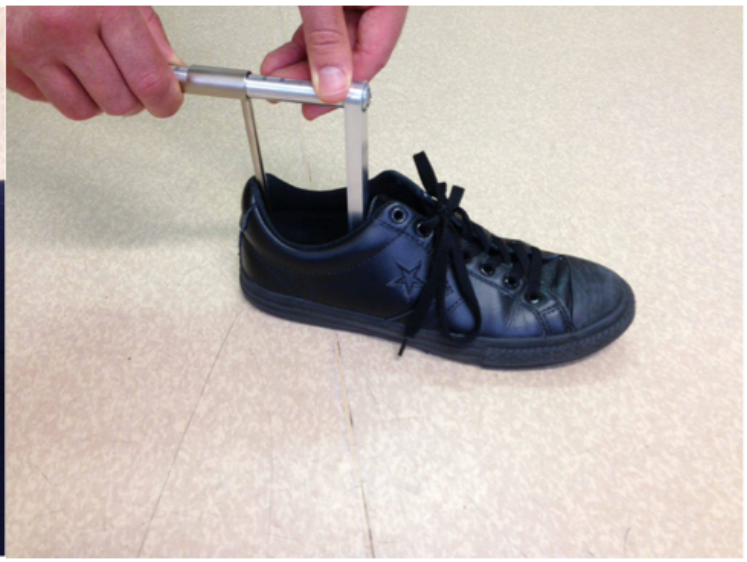

Figure 1

A. SATRA shore size stick. B. Internal Shoe size Gauge