

Footwear Assessment and Management

Understanding shoe construction and materials aids in properly fitting patients.

Goals and Objectives

After completing this CME, should have:

- 1) Knowledge of footwear construction and materials.
- 2) Skills to accurately assess the fit and suitability of footwear.
- 3) Current knowledge of the footwear options available to better treat patients.

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Following this article, an answer sheet and full set of instructions are provided (p. 176).—**Editor**

By Anita Williams

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Introduction

Footwear plays an important role in the maintenance of foot health in the healthy population, and has a vital role for people

with systemic diseases affecting the health status of the lower limb. Patients with diabetes, rheumatoid arthritis, connective tissue disorders, peripheral vascular disease and other conditions associated with compromised neurological status and poor tissue viability benefit from appropriate footwear. It is known that footwear has been found to be a precipitating cause of trauma

leading to lower extremity ulceration and amputation in people with diabetic neuropathy.¹⁻⁵

The benefits of appropriate footwear in patients with rheumatoid arthritis are reduction in pain, and increased mobility.⁶⁻⁸ In the elderly population, it is recognized that inadequate footwear such as badly worn shoes or slippers contribute to

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the occurrence of falls,^{9,10} demonstrating the complex interplay between footwear, walking, and balance. Inappropriate footwear can therefore impact on mobility, general health, independence and lifestyle. Therefore, appropriate footwear should be advised to these individuals with the aim of preventing falls and related problems, such as fractures and loss of mobility.

Footwear Construction and Materials

Parts of a Shoe

- **Vamp**—The upper is made of two main sections which together are molded to form the upper of the shoe. The front section is termed the vamp and covers the forefoot and the toes. In some designs of shoes, the vamp can be decorative and made of more than one piece, or embellished with different materials or stitching. There may be problems with this area if there is too much stitching and too many seams on the vamp. These prevent stretching of the vamp material over the forefoot and toes and may lead to pressure on bony prominences. The vamp is usually reinforced in the toe area. This toe box retains the shape of the front of the shoe and prevents it from collapsing onto the toes.

The toe box can be made from a variety of materials in-

cluding leather, man-made materials, or, in the case of safety footwear, steel and high density plastics. The tongue of the shoe is attached to the vamp. This is seen mostly in lace-up shoes and those with fastenings at the throat where the fit of the shoe is narrowest.

- **Quarters**—The sides and back of the upper are termed the quarters and the top edge is termed the topline of the shoe. The inner and outer sections of the top line are often joined in

There should be a small amount of toe spring at the front part of the sole so that the foot doesn't catch the ground during walking.

the center at the back of the heel. The inside of the quarter is usually reinforced around the heel with a stiffener called the 'heel counter' and has the purpose of stabilizing the rearfoot (particularly important in people with excessive foot pronation—flatfeet). In lace-up shoes the eyelets for the laces are at the front of the quarter. This part of the quarter covers the tongue, which is attached to the vamp or forms part of the vamp.

- **Throat**—The position of this area of the shoe is dependent on the style. It is formed by the seam joining the vamp to the quarter. A lower throat line (ex. lace-to-toe) will provide a wider opening

and is particularly useful in foot problems which require ease of access to the shoe, e.g., rheumatoid arthritis, rigid ankle deformities, etc. Also, the seam will not stretch and therefore dictates the maximum width of the shoe.

- **Toe cap**—This is a reinforcing cover stitched over the front of the vamp. It can be decorative, as in certain styles of shoe such as a strong oxford shoe, usually with ornamental perforations and wing tips..

- **Insole**—This is the flat inside of the shoe, which covers the midsole and filler between the upper and the sole.

- **Linings**—Linings are the inside of the vamp and quarter and can be softer material than the upper, and hence provide more comfort and add to the durability of the footwear. The lining in the bottom of the shoe is sometimes termed the insock (or sock lining) and can be full length or three quarters long.

- **Shank**—The shank reinforces the middle or the waist of the shoe from underneath to prevent it from collapsing or distorting. It, therefore, needs to be completely rigid or only slightly flexible. Shoes with a wedge sole, or very flat shoes, do not need a shank.

- **Outer sole (outsole)**—The under surface of the shoe can be made from a variety of materials and is joined to the upper in several different ways, e.g. welted, stitched, or adhesive applied. There should be a small amount of toe spring at the front part of the sole so that the foot doesn't catch the ground during walking. Toe spring is the angle between the flat surface and the height the toe is off the ground in relation to the ball of the shoe.

- **Heel**—The heel raises the shoe above the ground. If there is no raise at the heel area or the heel is lower than the sole then this is termed a negative heel. The material covering the area of the heel

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Figure 1: Shoe last

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that contacts the ground is called the top piece (or top lift) and this can be replaced or repaired.

Last Construction in Relation to Shoe Fit and Style

Lasts are the molds on which shoes are made (Figure 1). The design and shape of the shoe is dependent on the shape of the last. For example, a last for a high heeled shoe needs to be shorter than the foot for which it is being designed to compensate for the shortened 'equinus' position in which the foot is held. In order for a high-heel, pump-style shoe to stay on the foot its last will differ from the last required to make a lace-up shoe.

Last design and manufacture

is an extremely skilled craft. The measurements of the last are related to volume in addition to width and length and, in this respect, a last is not an exact impression of a foot. This is to ensure good fit and also takes into account the changing dimensions of the foot during movement.

Materials Used in Footwear Construction

- *Upper materials*—Leather is the most common material and has the advantage of being permeable so that moisture can evapo-

rate away from the foot. The advantage to foot health is that the skin is less macerated and therefore less likely for fungal infections to proliferate. Leather also stretches and accommodates to the uniqueness of the foot shape. The advantages of leather are negated by the use of synthetic linings and/or special coatings often used to protect the leather.

Some of the modern lining materials can be 'breathable' or 'wick' moisture away from the foot.

Some synthetic materials are also breathable, but are less supple than leather. The use of footwear with synthetic uppers should not be dismissed as long as they fit well and a suitable period of drying out is allowed between periods of use. Likewise, materials such as cotton corduroy may feel comfortable but only stretch in one direction and require reinforcement, particularly in the heel counter.

- *Linings*—In traditional footwear, it is usually soft leather or synthetic material. This does not generally cause a problem as they are usually confined to the quarters and the sock-lining, where the loss of stretch and permeability is not a problem. Some of the modern lining materials can be 'breathable' or 'wick' moisture away from the foot.

- *Soling and heels*—The sole must be durable, waterproof and have sufficient friction to prevent slipping. Leather was the traditional soling material, but is more expensive and is not as durable in some conditions. Man-made soling may be more durable and resilient to water. Some are designed with better grip (traction) depending on the pattern. The soles can be lighter, with cavities in the main soling material being injected with lighter weight foam. Combina-

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TABLE 1
Shoe Styles

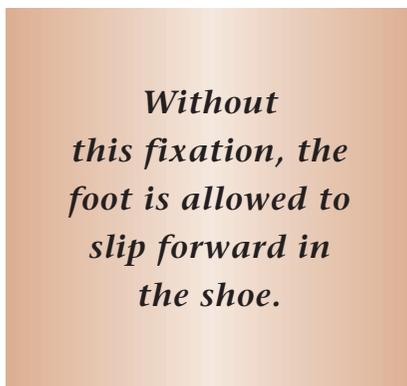
STYLE		DESCRIPTION
Boot		Any footwear extending above the ankle. There are numerous designs and types for a variety of uses, and made from a number of materials.
Clog		Footwear with no heel counter. The sole can be leather, synthetic, or wood.
Lace-up		Any low-cut shoe fastened by lacing.
Monk		Similar to Derby shoes, but with a cross-over section to fasten the quarters with a side buckle.
Moccasin		This used to be a simple one-piece hide held on with rawhide thongs. Today, moccasins can be slippers (with soft suede soles).
Mule		A backless shoe or slipper with or without a heel.
Sandal		An open shoe with the upper consisting of any decorative or functional arrangement of straps. A sandal is designed for simple utility or casual wear, or as a fashion shoe.
Court		Heeled shoes (various heights) with low-cut fronts and usually no fastening. Those with a low heel are termed pumps.

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tions of materials, e.g., a more durable outermost layer, and a softer, more flexible mid-sole for greater comfort, can be used. This can be a useful combination in patients presenting with foot pathology, foot pain and/or lesions associated with pressure. The heel can be made from synthetic material or 'stacked' layers of leather. The heel is covered with a 'top piece' (top lift), which can be replaced or repaired as the heel wears down with usage. The shank can be made of steel, wood or synthetic material. Toe boxes and stiffeners support the upper material and prevent it from collapsing onto the toe or inwards at the back of the shoe.

Shoe Styles

There are eight basic footwear styles, with the rest made up as variations on the basic themes



(Table 1). The definition of a shoe is footwear with a mechanism capable of holding the foot in the heel of the shoe to facilitate support during push off. Hence there are

two critical aspects of shoes, i.e., the fastening around the instep and the section corresponding to the heel. To prevent unnecessary movement, these need to be firm and fit the foot.

There are a variety of footwear styles that have evolved over centuries (for those who have an interest in the history of Footwear, visit www.footwearhistory.com or Curtin University website <http://podiatry.curtin.edu.au/history.html> for excellent information on the history of footwear).

Although style is dictated by current fashion and the required function of the footwear, any shoe that is considered suitable for foot function and protection must have a mechanism for holding the foot back into the heel of the shoe.

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TABLE 2
Footwear Assessment Checklist

OBJECTIVE ASSESSMENT	SUBJECTIVE ASSESSMENT
Easily accessible at the throat or vamp	Patient can get the shoes on themselves or their carer can
Strong secure fastening facings 10-12mm apart	No feeling of slipping inside the shoe
The heel counter should not collapse when pushed and the heel cradled into the shoe with no pressure on TA or malleoli	No excess pressure around the heel, or conversely, slippage
Length i.e., 1 cm. over the length of the longest toe for elongation during gait	No pressure on the end of the longest toe
The position of the ball of the foot and ball flex line of the shoe. These must correspond or will cause either cramping of the toes or flexion of the foot over shank > vamp creasing and the shoe will never be comfortable	No feeling of cramping at the toes
Adequate width so that there is no pressure on the joints. Sole must be wide enough so there is no overhang of the upper; takes account of static, dynamic and swollen foot > compromise to accommodate all three	Comfortable across the joints of the foot (remember patients with diabetic neuropathy like tightness so this has to be checked objectively)
Adequate depth over joints and toes to allow free movement and also at toe taper to eliminate pressure over the dorsal aspect of the toes and nails	No localized tight spots over areas of deformity
Width at toes—no side pressure or cramping: good style is important	No pressure over toes
Suitable heel height for normal heel-to-toe action. Broad heel for stability/weight redistribution	Feel stable when walking

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Without this fixation, the foot is allowed to slip forward in the shoe. This can result in friction on the sole of the foot and the toes impact into the front of the shoe, or in the case of sandals, the toes overhang the front of the sole. The two main important parts of any style of footwear are a band around the instep and corresponding support at the heel which need to be firm and fit closely to the contours of the foot in these locations.

The band around the foot prevents it from sliding forward and the corresponding support at the heel prevents it from slipping backwards and sideward. There-

The suitability of each of the main styles depends on the exact styling, heel height, materials used, and perhaps most importantly, the use to which a patient will put the footwear.

fore, mules, clogs, sandals, and court shoes may be seen as being unsuitable.

The suitability of each of the main styles depends on the exact styling, heel height, materials used, and perhaps most importantly, the use to which a patient will put the footwear. For example, high heel court shoes may be worn with minimum risks to foot health in healthy individuals, who wear them for a very short time with minimal weight bearing. If these shoes were worn for a long walk in the countryside, they would not function well and the feet would certainly suffer.

Footwear Assessment

It is important to ascertain if the footwear worn to the consultation are those which are usually worn. In fact, for new patients, it is often useful in the appointment letter to request that they bring a selection of the footwear mostly worn.

Patient's History of Footwear

Usage and Preferences

As with any assessment, it needs to be a structured systematic approach so that essential factors are not left out. It is important to ascertain a patient's shoe wearing habits. Information about when, where, and how often shoes are bought can be very useful. It is important to ascertain the footwear history, e.g., past successes/preferences, likes, dislikes, requirements for employment, e.g., safety footwear, and so on. Other factors that can be ascertained are financial circumstances and preferences with regards to body image.

Examination of the Footwear

Footwear needs to be evaluated with the patient walking, standing, and sitting. Once the

footwear has been taken off, it can be inspected further. The footwear can reveal clues to aid diagnosis so it is useful to start with an evaluation of any wear marks or distortions.

• *Wear marks*—Assessment of wear patterns of shoes (inside of shoe, upper and soles) may help

confirm a diagnosis or reveal information about foot function.¹⁵

Pressure under the sole of the shoe should be even, so no one part wears out excessively. Normal wear should occur at the lateral heel and medial central forefoot (Figure 2). There may also be slight curvature on the under-surface of the sole at the toe area, which is accentuated by walking. Variation from this indicates some abnormality.

If the tip of the sole is excessively worn, then the toe spring is insufficient. Conversely, absent wear at the tip of the sole indicates a lack of push-off during the gait cycle. If the sole curvature is absent, asymmetrical or excessive, this may indicate abnormal toe function, such as in rheumatoid arthritis. Excessive

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Pressure under the sole of the shoe should be even, so no one part wears out excessively.

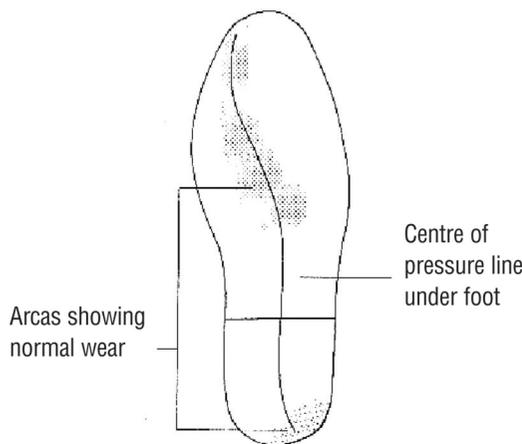


Figure 2 (left): Normal sole and heel wear pattern.



Figure 3 (right): Distortion of upper.

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forefoot wear indicates ankle joint equinus.

Circular forefoot wear over the first metatarso-phalangeal joint indicates pes cavus deformity. Normal heel wear spreads across the postero-lateral border of the heel. This reflects the slightly inverted position of the heel at heel strike during the gait cycle. Excessive heel wear on the inner border indicates a rigid everted rearfoot, while excessive wear on the outer border indicates a rigid inverted rearfoot; however, if the foot is flexible and excessively pronating during the gait cycle, the heel wear may well be heavy along the outer

border of the heel.

Crease marks in the shoe

Perhaps an obvious thing that the practitioner can do is to check whether the footwear is the right size.

upper normally run slightly oblique following the line of the metatarso-phalangeal joints. If it

is excessively oblique, this indicates failure of first metatarsophalangeal joint dorsi-flexion. If there is no crease at all, then propulsion is absent, such as in a short stride and/or flat-footed gait. Deformation of the upper is caused by the shoe conforming to foot deformities, such as hallux valgus, tailor's bunion, claw toes or abnormal foot function, pronation, for example (Figure 3). Wear patterns inside the shoe are likely to mirror those found on the heel and sole and the insole and sock lining will often display a print of the sole of the foot from which areas of high pressures can be assessed.

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TABLE 3 Footwear Suitability Scale (Nancarrow, 1999)

- | | |
|---|--|
| 1) Is the heel of your shoe less than 2.5 cm. (1")? | As the height of your heel increases, the pressure under the ball of your foot becomes greater. Increased pressure can lead to callus and ulceration. |
| 2) Does the shoe have laces, buckles or elastic to hold it onto your foot? | If you wear slip on shoes with no restraining mechanism, your toes must curl up to hold the shoes on. This can cause the tops of your toes to rub your shoes, leading to corns and calluses. Secondly, the muscles in your feet do not function as they should to help you walk. Instead they are being used less efficiently to hold your shoes on. |
| 3) Do you have 1 cm. (approx thumb nail length) of space between your longest toe and the end of your shoe when standing? | This is the best guide for the length of the shoe, as different manufacturers create shoes that are different sizes. Your toes should not touch the end the shoe as this is likely to cause injury to the toes and place pressure on the toe nails. |
| 4) Do your shoes have a well-padded sole? | Shoes should have supportive, but cushioned sole to absorb any shock and reduce pressure under the feet. |
| 5) Are your shoes made from material that breathes? | A warm, moist environment can harbor organisms, such as those that cause fungal infections. |
| 6) Do your shoes protect your feet from injury? | The main function of footwear is protection from the environment. Ensure your shoes are able to prevent entry of foreign objects that can injure the foot. If you have diabetes, a closed toe is essential to prevent injury to the foot. |
| 7) Are your shoes the same shape as your feet? | Many shoes have pointed toes and cause friction over the tops of the toes which can lead to corns, callus and ulceration. If you can see the outline of your toes imprinted on your shoes, then the shoe is probably the wrong shape for your foot. |
| 8) Is the heel counter of your shoe firm? | Hold the sides of the heel of your shoe between the thumb and forefinger and try to push them together. If the heel compresses, it is too soft to give your foot support. The heel counter provides much of the support of the shoe and must be firm to press. |

Footwear...

Examination of the fit of footwear (Table 2)

Perhaps an obvious thing that the practitioner can do is to check whether the footwear is the right size. There are two primary ways to do this. 1. Shoes on: to assess shoe fit have the patient stand in the shoes they wore in. Check for length, width, last, heel height, and balance. 2. Shoes off: with the

The first toe joint must fit into the widest part of the shoe where it is designed to bend so that the shoe and foot can bend together.

shoes off begin by measuring the length and width of the foot, and also investigate the heel-to-ball measurement and the depth of the footwear.

- *Heel fit*—The heel should be snugly cradled into the heel of the shoe to prevent gaping and slippage. The top edge of the heel counter should not dig into the Achilles tendon or malleoli. Heel fit also influences the entire fit of the shoe because the foot has a different stance inside a high-heeled and a low-heeled shoe, and also functions differently inside the shoe. When walking barefoot, the heel of the foot is lifted about two inches with each step, with the ball of the foot working as a fulcrum for the step-off.

The amount of heel rise is proportional to the length of the step. Therefore, the longer the stride, the higher the heel rise. In a shoe with a two-inch heel, there is no rise in the heel, because the shoe is already accounting for that rise. The higher the heel, the shorter the stride

and the body weight cannot shift from heel to ball as in barefoot walking, but is concentrated wholly on the ball.

In a flat-heeled shoe, the shoe and foot are functioning together with the heel lifting with each step and moving the weight forward onto the ball. In a low-heeled shoe the vamp will crease with the flexion of the forefoot. In a high-heeled shoe there will be no creasing as there is no flexion of the metatarsophalangeal joint. The low-heeled shoe requires more toe room in the fitting because there is more forward movement or extension of the foot with each step (Figure 5).

- *Length—heel-to-ball joint length*—This measurement is very important in successful shoe fit-

ting. Even if feet are the same length overall the length of the heel to ball measurement may be longer or shorter (Figure 4). This has major implications with regard to shoe fit and the patient's comfort. The first toe joint must fit into the widest part of the shoe where it is designed to bend so that the shoe and foot can bend together.

The practitioner must become proficient at determining the exact position of the first joint inside the shoe, because if it is too far forward, or back, the shoe may appear to fit overall, but it will never be comfortable. The patient can be asked to stand on tip toe and the flex line checked or, if the shoe has a removable full length lining, this can be

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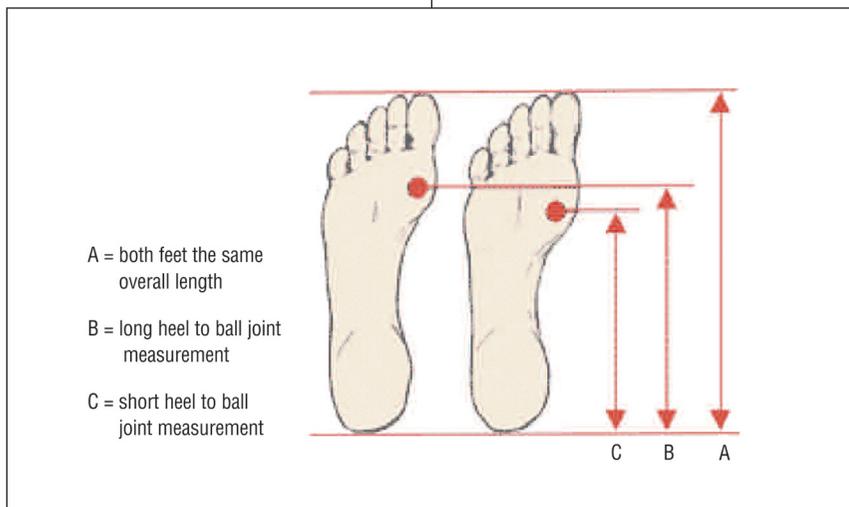


Figure 4: Foot length. A = both feet the same overall length; B = long heel-to-ball joint measurement; C = short heel-to-ball joint measurement

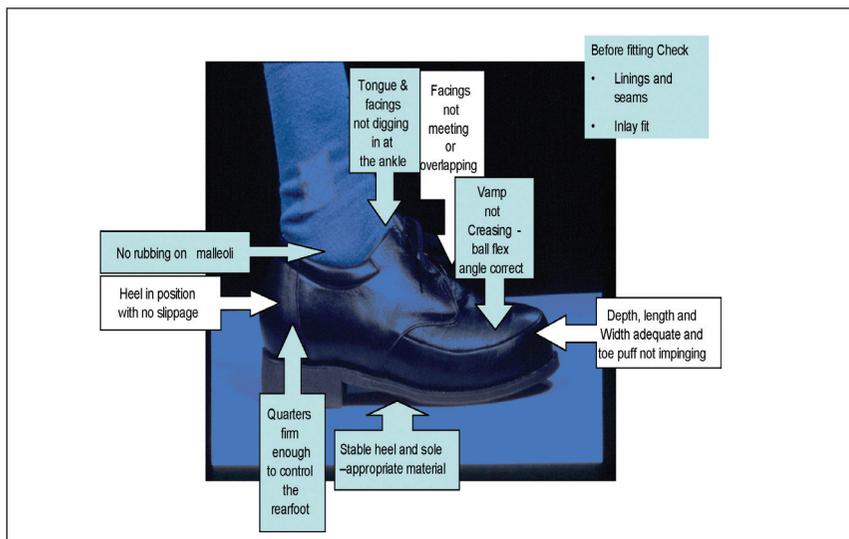


Figure 5: Key areas to check the fit of footwear.

Footwear...

used against the foot to check where the ball flex line occurs. If the ball joint position is too far forward the toes will be crowded in the toe box. If it is too far back the result is abnormal tread wear marks and excessive creasing of the vamp. These measurements can be taken using a Brannock measuring device (for more information www.brannock.com) which provides the practitioner with more information than the traditional size stick.

- *Length—ball joint to toe length*—Check the length of all the toes and don't assume that the first toe is the longest. Generally 1 cm. space at the end of the toes is considered sufficient. Also remember toe width and forefoot shape in relation to the style of shoe.

- *Ball width*—This is the width of the sole (ball tread) and insole as well as the upper. The shoe has to adapt to three different widths at the ball—with the foot at rest, weight bearing and under thermal conditions, i.e., swelling. Experience and judgment informs the practitioner which width will best suit all these conditions. Subjective feedback from the patient will also aid decisions.

- *Throat*—This is the entry point into the vamp or forepart area. There must be sufficient room when the shoe is fastened onto the foot to allow for the waist and instep to move during weight-bearing (a finger width at the back indicates sufficient room for this). A strong secure fastening to hold the rearfoot against the heel of the shoe prevents forward slide. The facings (spacing) (where the eyelets are) should be usually 10-12 mm. apart. If they are overlapping, the volume of the shoe is too much, and if they are wider apart than 12 mm., the shoe is too small (Figure 5).



Figure 6: An example of 'stock' footwear.



Figure 7: An example of custom-made footwear.

- *Patterns and vamps*—Patterns have a tremendous influence on shoe fit. This applies especially to the ease of getting the shoe onto the foot and keeping it on securely. There are long and short vamp lasts and generally the rounder the toe the more likely the vamp will be shorter; the more tapered the toe the longer the vamp. Vamp length is determined by the

Some footwear can be modified with rocker soles, which are helpful in reducing forefoot pressures in the diabetic foot and pain and pressure in the rheumatoid foot.

shoe's design (especially in the retail industry) and correct style is crucial for forefoot comfort and fit. An example of a long and short pattern would be a six-eyelet tie and a three-eyelet tie style, each made on the same last. The difference in the patterns will affect the way the foot extends into the shoe and will also affect the instep freedom. So, for example, where the

practitioner would be fitting a shoe that is required to accommodate a large hallux valgus joint a six-tie eyelet would be a better choice as the throat entry would be larger, enabling easier entry and better adjustment of the top line around the foot (Figure 5).

Footwear Options

There are now many manufacturers of retail footwear that is both appropriate for the foot health of our patients and is affordable. Many foot problems benefit from a change in footwear style or to a style with different features. Some footwear can be modified with rocker soles, which are helpful in reducing forefoot pressures in the diabetic foot and pain and pressure in the rheumatoid foot.

If patients have major foot problems or deformity then specialized therapeutic footwear can be provided. Pedorthists and orthotists are the professionals who have generally assessed and provided this therapeutic footwear but increasingly podiatrists are working alongside their pedorthic colleagues or taking on some of the pedorthists' role, particularly in the provision of stock footwear. Team working in this area has demonstrated improved clinical outcomes and patient satisfaction compared with working in isolation.¹⁶

It is important that podiatrists create good working relationships with their pedorthic colleagues in the assessment of patients, shared information and in the provision of the special-

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ized footwear.

Stock footwear is therapeutic footwear that is available in a variety of styles and fittings, for example, extra deep, and/or extra wide (Figure 6). Custom-made footwear (Figure 7) is an option when there is major deformity such as Charcot or advanced rheumatoid arthritis deformity (Figure 8), if there is a huge difference in symmetry, fixed equinus of more than 20 mm., or if the foot dimensions are outside the measurements for stock footwear.

Footwear Advice

Footwear can be perceived by individuals in a variety of ways and this depends on what the shoes are required to offer. Footwear can provide a specific function (e.g., toe protection in safety shoes) but in many people it is inextricably linked to body image. In this respect fashion trends can dictate the style and type of footwear worn by individuals. The achievement of a good clinical outcome for the patient relies on managing expectations and practitioners must recognize that patients may have aims different from their own. For example, the clinician's aim might be to



Figure 8: Rheumatoid arthritis foot deformity requiring custom footwear.

achieve optimum fit but to the patient the objective is to achieve comfort and/or style.

It is difficult for practitioners to recommend styles, as there are constant changes in fashion. It is better to recommend certain aspects of

Footwear can be perceived by individuals in a variety of ways and this depends on what the shoes are required to offer.

footwear that are important features with regard to fit (Table 3—Footwear Suitability Scale). These features may vary slightly according to the specific foot problems. For example, a patient with an equinus foot problem may benefit from wearing a sturdy

but higher heel than those recommended with forefoot pain and deformity.

Footwear Suitability Assessment Tools

Footwear assessment practices tend to be subjective and tend to focus on the style of the footwear rather than the suitability of the footwear for the individual patient and their presenting foot problems. Non-specialist footwear assessment relies on length and sometimes width and heel-to-ball measurement, but generally ignores the depth. Patients can generally understand what is meant by width, but may not understand the concept of



Figure 9: Diabetic neuropathic foot with amputation of the fourth toe.

depth unless it is demonstrated by the practitioner.

Because of the differences in the lasts used for different footwear and even differences in international sizing, there is lack of standardization. This makes it difficult for patients themselves to be able to identify footwear that is suitable for their foot health and their needs in respect to footwear usage. To address this problem a Footwear Suitability Scale was developed¹⁷ specifically for patients with diabetes. This has proven to be a useful tool in practice in non-diabetic patients and as an educational tool in ensuring that practitioners are able to identify, rationalize and explain the importance of each part of the shoe when providing advice for the patient (Table 3—

Footwear Suitability Scale).

It is important for the practitioner to know the retail trends, and sources of footwear that are suitable. Having leaflets on different footwear manufacturers may be useful in educating and informing patients about the

It is important for the practitioner to know the retail trends, and sources of footwear that are suitable.

sources of good footwear. However, the most important factor in getting patients to change their footwear 'behavior' is for the

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Figure 10: Lack of symmetry.

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practitioner to understand that it may take some time. It is known that knowledge doesn't necessarily influence behavior. Having the knowledge may be the start of a process for patients to think about change, make the change, and then maintain the change.^{18,19}

In situations where clients' shoes contribute to subjective symptoms, but there is no apparent conscious acceptance of this, then the practitioner may have to accept that this is the patients' personal decision. Under these circumstances negotiated care or compromise is required.

Conclusion

Footwear plays a vital role in the management of foot problems. Providing patients with the correct advice or referral for specialized footwear can impact on the success of other clinical interventions. Footwear assessment should be part of every visit to the podiatrist. Podiatrists need to develop skills in ascertaining the patient's problems in relation to footwear, the patient's potential for change and the solutions to their footwear problems. ■

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Providing patients with the correct advice or referral for specialized footwear can impact on the success of other clinical interventions.



Anita Williams is Lecturer Director of Podiatry at the University of Salford, and a member of the Centre for Rehabilitation and Human Performance Research.

See answer sheet on page 177.

- 1) Evidence supports the use of appropriate footwear in patients with rheumatoid arthritis, with the benefits being
 - A) reduction in pain, and increased mobility.
 - B) reduced need for pain-relieving medication.
 - C) prevention of deformity.
 - D) increased health status scores.
- 2) The upper of a shoe is comprised of two parts called
 - A) the insole and linings.
 - B) the vamp and quarters.
 - C) the topline and toe box.
 - D) the shank and counter.
- 3) The structure which supports the waist of the shoe is called
 - A) the toe box.
 - B) the vamp.
 - C) the heel counter.
 - D) the shank.
- 4) The purpose of a 'toe spring' is to
 - A) prevent catching of the front of the shoe on the walking surface.
 - B) relieve pressure on the toes.
 - C) prevent the toe box from collapsing.
 - D) improve the fit of the shoe.
- 5) Excessive heel wear on the inner border indicates
 - A) a rigid everted rearfoot.
 - B) a rigid inverted rearfoot.
 - C) a flexible and pronated foot.
 - D) a severe equinus deformity.
- 6) Excessively oblique crease marks in the upper indicates
 - A) absent propulsion such as in a short stride and/or flat-footed gait.
 - B) tailor's bunion.
 - C) cheap shoes.
 - D) failure of first metatarsophalangeal joint dorsiflexion.
- 7) When measuring the foot, if the ball joint position is too far forward the toes will
 - A) cause abnormal tread wear marks and excessive creasing of the vamp.
 - B) not reach the end of the shoe.
 - C) be crowded in the toe box.
 - D) be comfortable.
- 8) For a good fit, the facings of a shoe should
 - A) allow for tightening.
 - B) overlap.
 - C) meet.
 - D) have a large gap.
- 9) It is difficult for practitioners to give advice on footwear styles because of changes in fashion. It is better, therefore, to
 - A) not bother.
 - B) recommend certain aspects of footwear which have important features with regards to fit.
 - C) wait for the patient to find a proper style.
 - D) wait for fashion changes.
- 10) What is the main reason for assessing a patient's footwear?
 - A) Footwear influences foot health.
 - B) Patients expect it.
 - C) Patients have to change footwear styles
 - D) You need to make sure the shoes are a good value.
- 11) What is the most important fitting point?
 - A) width,
 - B) heel-to-ball and ball-toe
 - C) depth
 - D) heel fit
- 12) The normal shoe wear pattern on the heel is
 - A) central
 - B) medial
 - C) right across from medial to lateral
 - D) slightly lateral
- 13) What happens to forefoot pressures with an increase in heel height when standing?
 - A) Nothing
 - B) It decreases
 - C) It increases
 - D) It fluctuates
- 14) What happens if the heel-to-ball joint measurement is long?
 - A) The foot will not flex.
 - B) The foot flexes in front of the flex line of the shoe.
 - C) The shank irritates the foot.
 - D) The heel slips.

Continued on page 176

- 15) Excessive forefoot wear marks indicate
- A) excessive pronation.
 - B) excessive supination.
 - C) ankle equines.
 - D) rigid toes.
- 16) It is important to have a firm heel counter because it
- A) provides support at the heel.
 - B) makes the shoe look good.
 - C) stops the shoe from rubbing.
 - D) stops the foot slipping forwards.
- 17) Compared to the dimensions of a foot, the dimensions of a high-heeled shoe will be
- A) Longer.
 - B) Shorter.
 - C) Wider.
 - D) Deeper.
- 18) Leather is often used for the uppers of footwear as it is
- A) permeable.
 - B) non-permeable.
 - C) thermal.
 - D) flexible.
- 19) To increase the access to a shoe, the following is required:
- A) high quarters
 - B) a stiff heel counter
 - C) a substantial toe box
 - D) a low opening vamp
- 20) A well padded sole provides
- A) increased height.
 - B) extra protection and comfort.
 - C) protection from slipping.
 - D) a good shape to the shoe.

See answer sheet on page 177.

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