

# The ABCS of foot care in diabetes: C is for care

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This fourth article on risk factors for foot problems in people with diabetes discusses the need for adequate routine foot care and provides a patient handout on appropriate foot care and footwear.

Inadequate routine preventive foot care is one of the major risk factors for foot problems in people with diabetes. Peripheral neuropathy (anaesthesia), peripheral vascular disease (decreased blood supply) and structure (abnormal foot structure) are other risk factors. Together they are known as the ABCS of foot care, or the podiatric ABCS – A, anaesthesia; B, blood; C, care; and S, structure.

This article, the fourth in a series on foot care in people with diabetes, reviews the need for adequate routine foot care and includes a patient handout on appropriate foot care and footwear. Previous articles in the series have discussed the assessment of the ABCS and the various aspects of peripheral neuropathy and peripheral vascular disease, and a future article will discuss foot structure.<sup>1-3</sup> A patient handout summarising the podiatric ABCS, 'Your foot report', will conclude the series.

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## The foot factor traffic lights

Sometimes diabetes health professionals may overstate the case for meticulous foot care and tell everyone 'do this, don't do that, always do the other and never do...'. A person with diabetes who has normal sensation, circulation and structure needs the same foot care and footwear as a person without diabetes. But if a person with diabetes has a foot risk factor then more intense foot care and monitoring and special footwear may be necessary to reduce the likelihood of a problem developing, to detect problems early and to intervene promptly. The foot factor 'traffic lights' provide a practical framework to assess foot risk: the more amber and red 'lights', the higher the risk (Table 1).<sup>1,4</sup>

## Inadequate foot care

*'They hurt like mad. The little cracks don't worry me but when they get deep they make life unbearable and they take ages to heal.'*

Mark, who has had type 1 diabetes for 15 years and is wearing thongs.

In a way Mark is lucky: at least he is getting a warning that something is wrong. If he'd had neuropathy, the first thing he may have noticed might have been a red swollen foot and deep tissue infection.<sup>2</sup>

The indicators of inadequate foot care are easily assessed – look at the footwear, the skin (especially the weight-bearing areas, the heels and the interdigital spaces)



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and the toenails (Table 2). Having available a checklist of the podiatric ABCS can help with the six-monthly foot check component of the diabetes annual cycle of care supported by Medicare.<sup>5</sup> Identifying a problem prompts suggesting the appropriate care and noting the need to check its effectiveness at the next visit.

Mark has basically healthy feet in that he has no A (anaesthesia) or B (blood) risks. In Mark's case, the appropriate care would be for him to replace the thongs with more covered footwear, such as a sports shoe (Figure 1), and to gently use a pumice stone on his feet after showering to reduce the callus build up and then to use an emollient to stop the skin from cracking. The patient handout on page 83 provides guidelines for day-to-day foot care for people with diabetes.

## Priorities for foot care

*'There was no pain. It didn't hurt at all, even though there was a hole deep into my foot. I just know that my sock had a whole lot of muck in it. Pretty scary, I tell you.'*

Mark, five years later, with an ulcer under the first metatarsophalangeal head. Fortunately Mark's circulation was intact and his ulcer healed. If he'd had vascular disease as well as neuropathy, he could have lost the foot.<sup>3</sup>

Healthy low-risk feet are remarkably tough. They absorb the impact of striking the ground (several hundred kg/cm<sup>2</sup> each

continued

<b>Table 1. Foot factor traffic lights and patient risk assessment</b>			
<b>Foot factor traffic lights</b>			
<b>Foot factor assessment</b>	<b>Red lights – ‘Danger’</b>	<b>Amber lights – ‘Caution’</b>	<b>Green lights – ‘Healthy’</b>
Anaesthesia – Pinprick, light touch – Reflexes	No stimuli felt No reflexes	Reduced stimuli Reduced reflexes	All stimuli felt Normal reflexes
Blood – Pulse palpation	No pulses	Reduced pulses	Normal pulses
Care – Questioning* – Observation	– Skin breakdown	Foot care, footwear could be better Threatened skin breakdown	Appropriate foot care, footwear Normal skin
Structure – Observation	Weight-bearing ulcer	Callus or corn	No skin lesions
<b>Patient risk assessment</b>			
<b>Traffic lights</b>	<b>Risk assessment</b>	<b>Recommended action</b>	
One or more ‘red lights’	High risk	Refer promptly to a podiatrist	
One or more ‘amber lights’	Moderate risk	Regular podiatry care and assessment	
All ‘green lights’	Low risk	General foot care advice	
* Inadequate foot care in the absence of any other red or amber traffic lights is not a major risk factor for severe foot problems. Adequate foot care in the presence of one or more red or amber traffic lights is essential and can prevent severe foot problems.			

step) and progressively distribute the load from the impact (foot-strike) to weight-bearing and then to the push-off that drives the body forward. The distribution of the force on a normally shaped foot during a step is shown in Figure 2. In a foot with a low arch (a flat foot), the

pressure is concentrated on the inner medial side; in a foot with a high arch, the pressure is concentrated on the lateral side. Normal sensation and circulation ensure that the pain of tissue damage prompts protective behaviour and that minor damage heals promptly.

When we started the process of ‘civilisation’ we also started the process of eating more, doing less, getting fatter and less fit and hiding our feet – cramming them into ‘fashionable’ footwear. Even so, severe foot problems are unusual in low-risk feet: people might get blisters, corns, calluses and thickened skin and nails, but they keep their feet.

If sensation or circulation is impaired, however, or if the foot structure is abnormal, then certain self-care practices become a priority (Table 3). Relating these to the podiatric ABCS:

- a neuropathic foot will remain healthy if the protection and early detection

systems that are lost with nerve damage are replaced by careful protection and regular inspection

- an ischaemic foot may have a circulation adequate to maintain healthy tissues but not sufficient to heal damage<sup>3</sup> – the priorities then are to protect against damage and to minimise the risk of infection, such as through skin cracks on the heels or in the interdigital spaces
- healthy skin can be a leg-saving barrier, so maintaining skin health is important to reduce the risk of cracking and subsequent infection and to increase healing capacity – regular, frequent and generous application of a moisturiser is a cheap and highly effective way of maintaining skin integrity
- an abnormal foot structure will result in abnormal distribution over the foot of the forces of foot-strike,

<b>Table 2. Indicators of inadequate foot care</b>
<ul style="list-style-type: none"> <li>• Dirty feet</li> <li>• Inadequate or inappropriate footwear</li> <li>• Dry/cracked skin</li> <li>• Soggy/dirty interdigital spaces</li> <li>• Thickened skin (corn, callus)</li> <li>• Long/deformed/thick/ingrown nails</li> <li>• ‘Garter’ effect (causing vascular obstruction)</li> </ul>

weight-bearing and push-off, and may overload certain parts of the foot – regular inspections will pick up both the early and later signs of overload (early – redness; later – callus, corns, thickened nails) and prompt a review of footwear.

### Self-care and provided care

*‘I know they are a bit long but I missed my last podiatry appointment. Even if I could get at them, my scissors would be useless. The podiatrist always has to use great big shears to cut my toenails.’*

Betty, who has type 2 diabetes and whose nails fold over the tops of her toes.

Betty is not alone. There are many people who cannot reach or see their nails, cannot manage their own normal nails or would be at high risk should they damage their toes while cutting their nails.

In most cases, a relative or carer will be able to cut thickened nails on toes with normal circulation. However, podiatrist care will be required for nails that are very thick or deformed or when vascular deficit is extensive because special care and/or equipment will be needed. General practices involved with nail care should ensure they have the right equipment for the job in their foot care kit (Figure 3). A guide as to who should be performing routine foot care is given in Table 4.

Cutting the nails correctly and safely may meet the foot care needs of low-risk feet but if sensation or circulation are impaired or the foot has become deformed, more frequent (even daily) foot checks may be needed to ensure that the self-care priorities listed in Table 3 are met.

### Action plans

*‘Last time I had an ulcer on my foot I spent four weeks in hospital, had to go to a special clinic for three months and had a total of six months off work. I was lucky to get my job back. This time when I noticed the skin on my foot getting thicker, I saw the podiatrist as soon as I could. She cut the skin away, changed the lining of my*

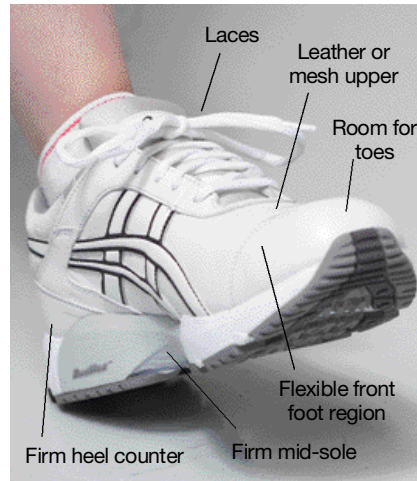


Figure 1. Sports shoes are often appropriate footwear for patients with diabetes who are at risk of foot complications. The features to look for when choosing a pair include laces, room for the toes, a flexible front foot region, a firm mid-sole, a firm heel counter and a leather or mesh upper.

*shoes and, Bob’s your uncle, I was back at work the next day.’*

Mark, who developed an action plan after his first ulcer.

The biggest risk factor for a future foot ulcer is a history of a preceding one. Both feet have at least the same risk factors as before and the affected foot is even more at risk because of the scarring and any damage to the normal foot structure. In Mark’s case, the previous ulcer occurred in an area of overload. Without well-selected footwear and/or orthotics to redistribute some of this load and a monitoring schedule

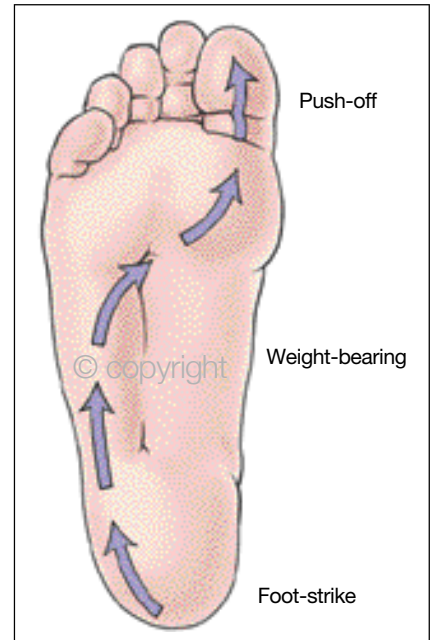


Figure 2. The distribution of force on a foot with a normal arch during a step.

to pick up and respond to early problems, a second ulcer in the same or a different area is highly likely.

Health professionals have monitoring schedules for chronic disease (for example, the Service Incentive Program annual cycle of care for diabetes) and triggers for action (for example, chest pain and an abnormal ECG). Patients with risk factors and/or a history of foot problems need to know when and how to look for indicators of possible complications. They also need to have practical guidelines on appropriate responses, including agreed

**Table 3. Priorities for patient self-care**

Presence of risk factor	Self-care required*		
	Hygiene	Inspection	Protection
Peripheral neuropathy	++	+++	++++
Peripheral vascular disease	++++	+	++++
Structural abnormality	++	++++	++++

\* +, ++, +++, ++++ indicate increasing order of priority.

continued



Figure 3. General foot care equipment: pumice stone, mild antiseptic, moisturiser, nail file and toenail clipper.

indications for seeking professional help and easy access to such help. The patient handout on page 83 includes some action plans for patients.

Triggers for patients to take action include the occurrence of the following on the feet:

- small cuts – to avoid cellulitis
- thickened skin – to avoid ulcer development
- inflammation – indicating infection or fracture.

Actions to be taken by the patient include simple first aid, seeing a podiatrist for advice about footwear and foot care, and seeing a doctor or podiatrist for treatment of fungal or other infections. Podiatrists can treat fungal and non-extensive bacterial infections and can refer patients for treatment of more severe infections.

**Conclusion**

People with diabetes who have normal sensation, circulation and structure need the same foot care and footwear as people without diabetes. The presence of one or more of the foot risk factors, however, calls for more intense foot care and monitoring and possibly for special footwear to reduce

**Table 4. Care providers in foot and toenail management**

Patient self-care	Relative/supporter care	Podiatrist care
Patient: <ul style="list-style-type: none"> <li>• can see feet and nails</li> <li>• can reach feet and nails</li> <li>• has normal nails</li> <li>• has no PVD</li> </ul>	Patient: <ul style="list-style-type: none"> <li>• cannot see feet and nails</li> <li>• cannot reach feet and nails</li> <li>• has normal nails</li> <li>• has no PVD</li> </ul>	Patient: <ul style="list-style-type: none"> <li>• has abnormal nails</li> <li>• has PVD</li> </ul>

ABBREVIATION: PVD = peripheral vascular disease.

the likelihood of problems developing. Even though the foot risk factors may be irreversible or even progressive, severe complications like infections and amputation can be delayed or avoided by appropriate foot care, early detection of problems and prompt intervention.

Patients with neuropathy should be made aware of potential foot complications and should wear appropriate protective footwear and monitor their feet for signs of abnormal pressure or damage. Patients with decreased circulation, and therefore impaired ability to heal any damage, should practice appropriate skin and nail care, wear protective footwear and watch for and respond to breaks in the skin of their feet. Patients with abnormal foot structure should watch for signs of increased pressure (skin redness or thickened skin or nails) and seek advice on ways to remove the excess pressure, even (or especially) when no pain is felt. **MT**

**References**

1. Phillips P, Evans A. The ABCS of foot care in diabetes: assessing the risk factors. *Medicine Today* 2008; 9(11): 57-61.
2. Evans A, Phillips P. The ABCS of foot care in diabetes: A is for anaesthesia. *Medicine Today* 2008; 9(12): 61-67.
3. Phillips P, Evans A. The ABCS of foot care in diabetes: B is for blood. *Medicine Today* 2009; 10(2): 65-68.
4. Phillips PJ, Evans AM. Foot problems. Check

program of self assessment. RACGP Unit 409, March 2006.

5. Harris P, Mann L, Marshall P, Phillips P, Webster C. *Diabetes management in general practice 2008/9*. 14th ed. Canberra: Diabetes Australia; 2008. Available online at <http://www.racgp.org.au> (accessed February 2009).

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