

# The ABCS of foot care in diabetes: assessing the risk factors

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This first article in a series on risk factors for foot problems in people with diabetes introduces the ABCS of foot care.

GPs are familiar with the ABCs of diabetes care – A<sub>1c</sub> (glycosylated haemoglobin; A), blood pressure (B), cholesterol (C), smoking (s) and salicylates (s) – which refer to the risk factors for diabetes complications in general. This article introduces the ABCS of foot care in people with diabetes – which refer to the risk factors for diabetes-related foot problems. The ABCS are:<sup>1</sup>

- A – anaesthesia (i.e. peripheral neuropathy)
- B – blood supply (i.e. peripheral vascular disease)
- C – care (i.e. routine preventive foot care)
- S – structure (i.e. abnormal foot structure).

Neuropathy and/or peripheral vascular disease in people with diabetes, along with poorer defence against infection, can mean that minor foot injuries develop into foot ulcers that can take months to heal, or possibly lead to amputation. The loss of a toe, foot or leg usually heralds

a loss of more of that leg and/or of the other leg – almost 3400 Australians had lower limb amputations in 2004–05.<sup>2</sup> Foot problems are second only to cardiovascular problems in terms of health care costs in patients with diabetes.<sup>3</sup>

The foot factors, the ABCS, become important for those people with diabetes who are aged over 60 years, who have had diabetes for 20 years or more, or who have significant macrovascular complications (i.e. coronary artery disease, cerebrovascular disease) and/or microvascular complications (i.e. retinopathy, nephropathy). The Commonwealth Government recognises the importance of foot problems in people with diabetes. Medicare's routine 'annual cycle of care for diabetes' (which attracts a Service Incentive Program [SIP] payment) includes a six-monthly foot check, and the Medicare Plus services

available through Team Care Arrangements (TCAs) include podiatry.<sup>4</sup>

Foot review in diabetes is focused on the ABCS because people with diabetes are prone to peripheral neuropathy and peripheral vascular disease and often need special care to avoid problems, especially as they are likely to have abnormal foot structure. The box on page 58 summarises the ABCS of foot care and the assessing of these factors.

The 5 A's – Ask, Assess, Advise, Assist and Arrange – provide a practical framework for foot care (Table 1):

- Ask about symptoms
- Assess signs
- Advise on foot care, footwear and action plans
- Assist by involving other carers
- Arrange regular reviews, and specialist referrals if indicated.

The diabetes annual cycle of care supported by Medicare provides a structure for ongoing diabetes care and the opportunity to apply the 5 A's in the six-monthly foot check (Figure).<sup>4</sup>

A practice nurse can apply the first four A's – ask, assess, advise and assist, as listed in Table 1 – and then use the findings of the first two A's to grade the level of risk of the feet using the foot factor 'traffic lights' listed in Table 2. The nurse should bring to the attention of the GP

## Comments on foot problems from patients with diabetes

*'My feet feel like they are wrapped in cotton wool...'*

*'I can get to the first floor but then it gets too painful...'*

*'My skin is so dry and cracks so easily... and I'm finding it hard to get my hands close enough to cut my nails...'*

*'My family laughs but having bunions isn't funny. I have to get special shoes or stretch them, and to cut holes in my slippers...'*



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**The ABCS of diabetic foot care and their assessment**

**A - Anaesthesia**



Peripheral neuropathy

Check:

- Abnormal sensation
- Loss of sensation

**B - Blood supply**



Peripheral vascular disease

Check:

- Symptoms of claudication
- Pulses
- Ankle to brachial pressure index

**C - Care**



Check:

- Foot care routines
- Visual impairment, musculoskeletal stiffness
- Footwear

**S - Structure**



Check: • Arches



Check: • Alignment



any patients with warning signs of neuropathy, peripheral vascular disease, inadequate self-care or abnormal foot structure.

The GP can then apply the fifth A, 'arrange', by individualising foot care using a graded approach depending upon the foot assessment findings. In the 'traffic lights' approach (Table 2):

- all 'green lights' indicates low risk – general foot care advice recommended
- one or more 'amber lights' indicates moderate risk – regular podiatry care and assessment required
- one or more 'red lights' indicates high risk – referral to a podiatrist required.

The GP's arrangements for referrals can be made through GP Management Plans (GMPs) and Team Care Arrangements (TCAs), for which Medicare support may be claimed.

**Assessing A - presence of anaesthesia**

The gold standard for checking sensation is to determine the thresholds for vibration, temperature or touch, which can be time-consuming and complex. It is much simpler, and generally quite sufficient, to follow the 'Keep it short and simple' (KISS) principle and ask the patient about symptoms of abnormal sensation (dysaesthesia) or loss of sensation (anaesthesia) and to check for loss of sensation.

A quick check of sensation is to see if the patient can, with their eyes shut, feel cotton wool being bent at several different parts of the foot. If he or she cannot feel the cotton wool, the test should be tried using a finger – assuming the tester has normal sensation, if the tester can feel the touch then so should the patient. The final check, and a very

convincing demonstration to the person, is to repeat the exercise with the person's eyes open. Patients can then see they have a loss of sensation and will understand better that they have a potential problem and need to take precautions.

Ideally, a 10 g monofilament should be used in preference to cotton wool as it has been shown to identify those patients at immediate risk of undetected foot injury. The force of 10 g required to bend a correctly calibrated monofilament indicates loss of enough sensation for the foot to be at risk of such injury.

Checking for sensation to pinprick (using a disposable sharp) and checking reflexes confirms any abnormality.

Neuropathy accompanied by pain is less common but more distressing than neuropathy without pain. Glycaemia and diet should be reviewed in patients with painful neuropathy, and medication such

**Table 1. The ABCS and the 5A's - a framework for foot care**

ABCS of foot care	The five 5A's				
	Ask about symptoms	Assess signs	Advise about foot care and/or footwear	Assist by involving other carers	Arrange reviews and/or referrals
Anaesthesia	Any tingling, numbness?	Sensation	Daily foot care routine Inappropriate footwear	Possibly a relative or other carer, a visiting nurse or a podiatrist	Podiatry assessment and review, action plan
Blood supply	Any claudication, cold feet?	Pulses	Daily foot care routine Inappropriate footwear	Possibly a relative or other carer, a visiting nurse or a podiatrist	Podiatry assessment and review, action plan
Care	What foot care routines are followed? Do shoes fit well?	Nails and skin (thickening, drying, cracking)	Foot care routines Appropriate footwear	Possibly a relative or other carer, a visiting nurse or a podiatrist	Education, ongoing review
Structure	Any foot soreness?	Foot arches, angles and abnormalities - when standing	Special footwear	Possibly a relative or other carer, a visiting nurse or a podiatrist	Orthotic, podiatry and/or physiotherapy review

as capsaicin cream (Zostrix HP) or night-time amitriptyline (Endep) may be used as symptomatic treatment. Gabapentin (e.g. Neurontin) or pregabalin (Lyrica) may also be used. Sleep disturbances and associated emotional distress need to be addressed.

Peripheral neuropathy should be assumed until proven otherwise in patients who have had diabetes for 20 years or more.

### Assessing B - decreased blood supply

Once again the KISS principle applies. The ankle to brachial Doppler pressure index or plethysmograph may be the ideals but it is much simpler to ask for symptoms of claudication or 'freezing feet' and to check pulses (femoral, popliteal, posterior tibial and dorsalis pedis).

If Doppler ultrasound equipment is available, the ankle to brachial pressure index should be checked (below 0.9 is abnormal). When peripheral arterial disease is recognised, a vascular consultation should be considered. Early assessment and intervention in vascular disease may prevent an amputation.

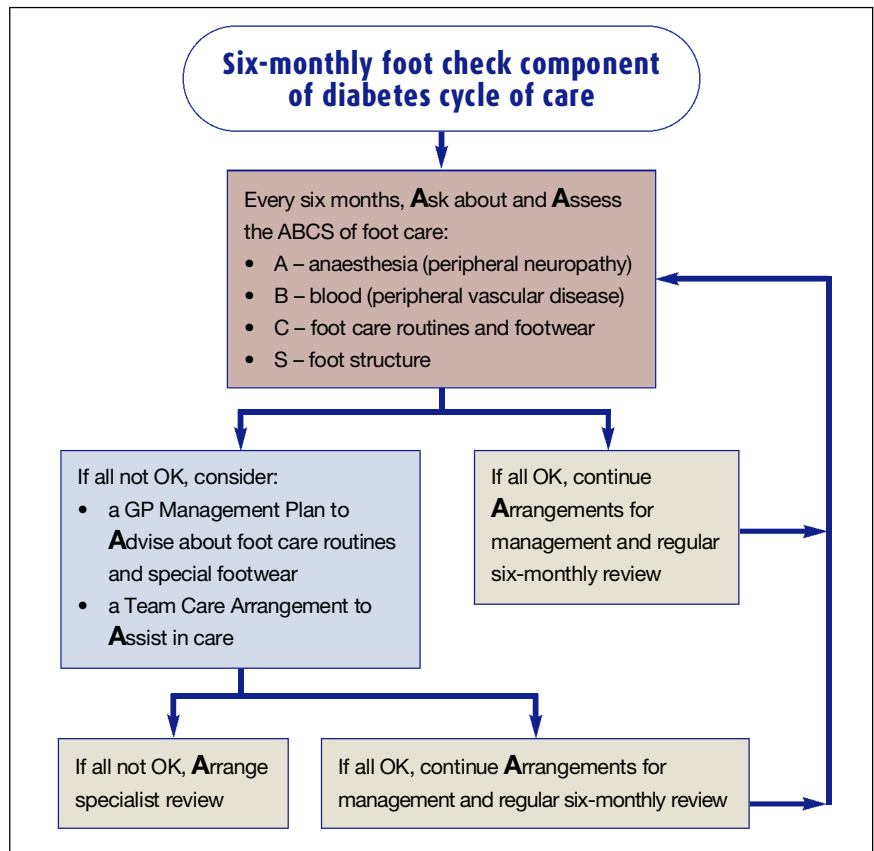


Figure. Implementing the 5A's in the foot examination section of Medicare's annual cycle of care for diabetes patients.<sup>4</sup>

**Table 2. Foot factor traffic lights and patient risk assessment**

Foot factor traffic lights			
Foot factor assessment	Red lights – ‘Danger’	Amber lights – ‘Caution’	Green lights – ‘Healthy’
Anaesthesia – Pinprick, light touch – Reflexes	No stimuli felt No reflexes	Reduced stimuli Reduced reflexes	All stimuli felt Normal reflexes
Blood supply – 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
Patient risk assessment			
Traffic lights	Risk assessment	Recommended action	
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.			

If a person is a smoker, has had diabetes for 20 years or longer, or has coronary artery disease or cerebrovascular disease, they should be assumed to have peripheral vascular disease until proven otherwise.

### Assessing C – foot care and footwear

A person with normal sensation and circulation is warned of damage by pain and protected from limb-threatening problems by the body’s healing capacity. Inadequate foot care or inappropriate footwear may not be much of a threat.

But things can change. Both neuropathy and vascular damage are quite advanced before they become symptomatic or are associated with clinical signs. A small self-care and/or footwear problem now may be a significant risk in 10 years’ time.

Anyone with diabetes, and especially someone with one or more of the other

ABCS (i.e. peripheral neuropathy, peripheral vascular disease and/or abnormal foot structure) should have his or her routine foot care and the appropriateness of his or her footwear reviewed at least every six months. A problem (especially a skin lesion on a weight-bearing area) should prompt early referral.

### Assessing S – foot structure

The foot has two natural arches (i.e. anteroposterior and mediolateral), one natural orientation (and two unnatural ones – inpointing and outpointing) and, in diabetes, two potential problems associated with neuropathy (i.e. clawed toes from motor neuropathy and a ‘collapsed’ foot from sensory neuropathy).

Structural abnormalities are common and are indicated by localised corns and calluses. In a person without neuropathy or peripheral vascular disease and with appropriate foot care and footwear, they

are usually only minor problems of discomfort. In a person with diabetes and one of the other ABCS, however, abnormal foot structure can become limb-threatening.

The foot should be examined in its functional position (standing), both with and without its usual footwear. Check the longitudinal and transverse arches, the alignment (inpointing or ‘pigeon toed’; outpointing or ‘duck feet’) and for bunions or clawed toes (often associated with motor neuropathy).

It is often easier to see ‘odd shaped feet’ and inappropriate footwear if the person is watched walking barefoot and then in his or her usual footwear. Odd shaped feet in a person with diabetes need assessment by a podiatrist and/or an orthotist with an interest and experience in diabetes. Surgical intervention may be indicated if conservative measures fail to accommodate the feet.

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## Conclusion

Patients with diabetes need differing intensities of foot care. Some need general education and regular podiatry, others need specialist team care to successfully manage their foot ulcers, and some will need amputation as their circulation deteriorates to the stage of being adequate only to maintain health and not heal damage.

The framework of foot care in people with diabetes can be summarised as:

- check the ABCS – sensation, pulses, skin and nail care and misshaped feet – every six months as part of the SIP cycle
- use the 5 A's (ask, assess, advise, assist, arrange) to review foot care risk
- organise a Team Care Arrangement and specialist referral if there are existing or potential problems. **MT**

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Dr Evans. None.

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