

## Everything counts but graft surveillance does not always predict graft failure



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**G**raft surveillance should allow intervention before perfusion fails and therefore prevent the recurrence of critical limb ischaemia and possible amputation. Carter et al (summarised to the left) describe their prospective study of graft surveillance. During an 18-month period, over 21 % of grafts occluded. Only vein graft failures were likely to be preceded by a progressive stenosis and, of those that developed a stenosis, not all progressed to occlusion. With distal or synthetic grafts, graft surveillance did not predict failure or detect stenoses before occlusion. The authors question the value of graft surveillance in synthetic and distal bypass grafts. Interestingly, diabetes did not predispose individuals to graft failure. Early statin use after bypass surgery was protective and should be encouraged.

Winkley et al (see below) also describe 18-month outcome data. In 253 people with first foot ulceration, mortality was 15.8 % and recurrence of ulceration was 43 %; both were predictably high in view of other similar data. Amputations were

over 15 % in total but only 5 % overall had an amputation above the ankle. The main predictors of mortality were age, ischaemia, a lower glycosylated haemoglobin (type 2 diabetes being better controlled than type 1) and depression (potentially a sign of poorer self-care or the negative impact of a rotting limb). Only the University of Texas classification of ulcer severity predicted the likelihood of amputation. Other microvascular complications, neuropathy, nephropathy and retinopathy were the main predictors of ulcer recurrence. These findings confirm many of the known factors relating to foot disease in diabetes and the need for a more holistic approach to care.

In a brief homage to the return of News at Ten, not that it has been watched by many people, 'and finally', Harrison et al (see overleaf) borrowed a shoe-measuring device from Clarks the shoe seller and measured the feet and shoes of individuals with foot problems. In general, these shoes were too small and, in particular, too narrow. It is not really new news; every time a person with neuropathy tells me that they thought their shoes were okay because they felt like a good fit, it makes me smile.

## JOURNAL OF DIABETES AND ITS COMPLICATIONS

### Clinic-based measures predict adverse outcomes

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

**1** This prospective, population-based cohort study aimed to assess how clinic-based measures of diabetes and foot status at baseline predict adverse outcomes at 18 months in people presenting with their first diabetic foot ulcer. Adults with type 1 or type 2 diabetes, without severe ischemia, were followed up for the occurrence of amputation, re-ulceration or death (n=253).

**2** There were 40 deaths (15.8 %), 36 amputations (15.5 %) and 99 ulcer

recurrences (43.2 %) by 18 months.

**3** Mortality was predicted by older age (HR: 1.07; 95 % CI: 1.04–1.11), lower HbA<sub>1c</sub> (HR: 0.73; 95 % CI: 0.56–0.96), moderate ischaemia (HR: 2.74; 95 % CI: 1.46–5.14) and depression (HR: 2.51; 95 % CI: 1.33–4.73).

**4** Amputation was only significantly predicted by ulcer severity (HR: 3.18; 95 % CI: 1.53–6.59); microvascular complications were the only factor associated with recurrent ulceration (HR: 3.34; 95 % CI: 1.17–9.56).

**5** Clinic-based measures may therefore be important in the risk assessment for adverse outcomes following the first presentation of a foot ulcer by a person with diabetes.

Winkley K, Stahl D, Chalder T (2007) Risk factors associated with adverse outcomes in a population-based prospective cohort study of people with their first diabetic foot ulcer. *Journal of Diabetes and its Complications* **21**: 341–9

## ANNALS OF VASCULAR SURGERY

### Graft surveillance does not identify lesions

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓✓

**1** Graft surveillance identifies which grafts are at risk of failure, but there is controversy over which grafts benefit most from surveillance.

**2** This study aimed to investigate the natural history of graft failure following myointimal hyperplasia and to identify risk factors and prevalent time periods for graft failure.

**3** The authors analysed 212 infrainguinal skin grafts in 197 people.

**4** In total, 21.6 % of grafts occluded, 16 % underwent a salvage procedure (40.5 % of these at 6 months following surgery) and 56.6 % were preceded by a stenotic lesion.

**5** Primary occlusions were more common in the prosthetic group (95.9 %) than the femorocrural group (66.5 %).

**6** Vein graft failures were most likely to be preceded by a progressive stenosis (58.3 %), which formed most commonly at the proximal anastomosis. Over 40 % of stenoses resolved or did not progress.

**7** Overall, 56.2 % of grafts remained stenosis free, with few occurring in the prosthetic group.

**8** Post-operative use of statins reduced stenosis and occlusion occurrence, particularly in grafts above the knee (P=0.03). Smoking status or presence of diabetes were not found to be risk factors.

**9** Graft surveillance detects stenoses in vein grafts likely to fail without intervention, but does not identify lesions prior to occlusion in the majority of prosthetic and femorocrural grafts.

Carter A, Murphy MO, Halka AT (2007) The natural history of stenoses within lower limb arterial bypass grafts using a graft surveillance program. *Annals of Vascular Surgery* **21**: 695–703

## INTERNATIONAL JOURNAL OF CLINICAL PRACTICE

### Assessing footwear may improve prevention and healing of ulcers

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓

**1** Foot ulceration is a common complication of diabetes and can be caused by ill-fitting shoes. This study investigated the proportion of people with diabetes who wear inappropriate footwear.

**2** One-hundred people with diabetes aged 24–89 years attending the

general clinic had their foot length measured using a 'Clarks' shoe-fitting device. Callipers were used to measure the width.

**3** The investigators also recorded any deformities and neurovascular status.

**4** Only 24 % of people had correctly fitting shoes of the appropriate length and width when seated and 20 % while standing (17 % crossover).

**5** The majority of people with diabetes wear inappropriate footwear, particularly shoes that are too narrow. Assessing footwear at routine foot examination may lead to improvements in the prevention and management of diabetic foot ulcers.

Harrison SJ, Cochrane L, Abboud RJ, Leese GP (2007) Do patients with diabetes wear shoes of the correct size? *International Journal of Clinical Practice* **61**: 1900–4

## DIABETIC MEDICINE

### Exercise is beneficial on foot perfusion

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

**1** This study looked at the effect of brief exercise on changes in foot perfusion in people with peripheral arterial occlusive disease (PAOD) and with or without diabetes. People were classified according to the presence or absence of diabetes, PAOD and peripheral neuropathy.

**2** In total, 116 limbs of 61 individuals were assessed. Toe pressure and toe-brachial pressure indices increased following exercise in people with arterial

disease and no diabetes, but not in those with diabetes.

**3** People with diabetes had an increase in foot transcutaneous oxygen tension, while transcutaneous carbon dioxide tension decreased in all with arterial disease.

**4** These results indicate an improved cutaneous perfusion response to post-exercise local heating. In people without diabetes, elevated toe pressure suggests that enhanced lower limb macrovascular haemodynamics are associated with improved perfusion.

**5** People with diabetes demonstrate a change in cutaneous perfusion at foot and chest sites; therefore, brief exercise is beneficial in people with non-critical PAOD, especially those with diabetes.

Williams DT, Harding KG, Price PE (2007) The influence of exercise on foot perfusion in diabetes. *Diabetic Medicine* **24**: 1105–11

## DIABETES CARE

### Reduced incidence of amputations

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

**1** In order to assess the incidence of amputations in Leverkusen, Germany, between 1990 and 2005, complete lists of non-traumatic lower limb amputations from all three city

hospitals were obtained.

**2** Of 692 people with an amputation, 72 % were diagnosed with diabetes and 58 % were male.

**3** Over 15 years, there was a 37.1 % reduction in amputations above the toe (95 % CI: 12.3–54.8).

**4** In people without diabetes, there was no change in amputation incidence ( $P=0.1981$ ).

Trautner C, Haastert B, Mauckner P (2007) Reduced incidence of lower-limb amputations in the diabetic population of a German city, 1990–2005: results of the Leverkusen Amputation Reduction Study (LARS). *Diabetes Care* **30**: 2633–7

## DIABETES CARE

### Wound healing is not delayed in people with diabetes

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

**1** Few studies have investigated microvascular dysfunction, neuropathy, and abnormal cellular and inflammatory responses as factors in delayed wound healing in people with diabetes.

**2** This study compared 12 individuals without diabetes with 12 people who had type 2 diabetes and neuropathy, but no microvascular disease, to quantify the rate of wound healing following a dorsal foot skin biopsy.

**3** The rate of wound healing was measured with respect to skin neurovascular structure and function, as measured by laser Doppler imager (LDI)max.

**4** Blood vessel density, small nerve fibre function (LDIfibre), nerve fibre density, vascular endothelial growth factor (VEGF) and its receptor FLK1, and hypoxia-inducible factor (HIF)-1 $\alpha$  expression were also measured.

**5** Compared with controls, people with diabetes had significantly reduced maximum hyperemia, VEGF-A, blood vessel VEGFR-2 expression, neurogenic flare response and dermal nerve fibre density.

**6** Despite these differences, the rate of wound closure was identical for controls and people with diabetes. There was also no significant difference in HIF-1 $\alpha$  and dermal blood vessel density.

**7** The authors conclude that wound closure is not delayed in people with diabetes despite changes in neurovascular structure and function.

Krishnan ST, Quattrini C, Jeziorska M (2007) Neurovascular factors in wound healing in the foot skin of type 2 diabetic subjects. *Diabetes Care* **30**: 3058–62

‘Wound closure is not delayed in people with diabetes despite changes in neurovascular structure and function’