# Lower limb complications

## Was it worth it?

*Matthew Young, Consultant Physician, Edinburgh Royal Infirmary, Edinburgh*

Buckley et al (summarised alongside) present the results of a systematic review of podiatry as an intervention to prevent lower extremity amputations (LEAs). Unfortunately, but not surprisingly, like many previous systematic reviews it concludes that the studies are too heterogeneous, underpowered and badly designed to be able to provide conclusive evidence, in this case as to whether podiatry prevents amputations in people with diabetes. Is this the end of podiatry? I think not.

For a long time now I have been arguing that primary preventative podiatry cannot be expected to have a major measurable impact on the development of foot ulceration in low-risk individuals with diabetes. Essentially, foot ulceration develops at a low rate in these people and the treatment effect is low, since most ulcers develop with short notice, or spontaneously, if the puzzlement of our patients is to be believed.

Therefore, the numbers needed to treat and prevent one ulcer is in the thousands and no clinical trial is going to detect such differences. Population studies might do and the National Scottish Care Information (SCI) diabetes database has already reported a reduction in amputations, but there are many factors which play into this (Kennon et al, 2011).

However, even targeting high-risk patients for podiatry alone might not reduce amputations as these are often determined by infection or degree of vascular disease. It is only multidisciplinary teams (MDTs), of which podiatrists are a vital part, responding promptly to early referrals and providing interventions including appropriate debridement, effective off-loading, comprehensive infection control and timely vascular interventions that have, across the globe, reported reductions in amputations, even where local services previously existed. Nason et al (summarised alongside) is the latest to do so.

> *"Therefore, before we dismiss podiatry as not proven, we need to ensure that primary, and secondary, preventative podiatry is performed in the context of available multi-disciplinary teams and wider networks with prompt referrals once problems occur."*

Therefore, before we dismiss podiatry as not proven, we need to ensure that primary, and secondary, preventative podiatry is performed in the context of available MDTs and wider networks with prompt referrals once problems occur. Once this is in place then perhaps amputation rates will fall globally and not just in those areas with a specialist service.

Kennon B, Leese GP, Cochrane L et al (2012) Reduced incidence of lower-extremity amputations in people with diabetes in Scotland; A nationwide study. *Diabetes Care* **35**: 2588–90

BMJ OPEN

## Does contact with a podiatrist reduce amputation risk?

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

1 The authors conducted a systematic review and meta-analysis to investigate whether contact with a podiatrist affects the incidence of lower extremity amputation (LEA) in people with diabetes.

2 Literature searches of PubMed, CINAHL, EMBASE and Cochrane databases identified six research articles for inclusion into the study.

3 A meta-analysis on two randomised controlled trials revealed that contact with a podiatrist was not significantly correlated with the risk ratio (RR) of LEA (RR 1.41; 95% CI, 0.20–9.78). A separate meta-analysis on three cohort studies also found no association between podiatry and LEA (RR 0.73; 95% CI, 0.39–1.33).

4 The authors concluded that the data available on LEA and contact with a podiatrist is insufficient to make any conclusions.

Buckley CM, Perry IJ, Bradley CP et al (2013) Does contact with a podiatrist prevent the occurrence of a lower extremity amputation in people with diabetes? *BMJ Open* **3**: e002331 doi:10.1136/bmjopen-2012-002331

IR J MED SCI

## Dedicated diabetic foot care teams are cost-effective in Ireland

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

1 Lower limb amputation resulting from foot ulceration is a devastating, but avoidable complication of diabetes. The introduction of specialist diabetic foot teams into diabetes care has been proposed to aid the prevention of both ulceration and amputation.

2 The aim of this study was to determine the cost-effectiveness and viability of a multidisciplinary foot protection clinic (MDFPC) in an Irish hospital setting.

3 A consultant-led MDFPC was established in June 2008, which ran every 2 weeks. Specialities covered included vascular surgery, endocrinology, orthopaedic surgery, podiatry, orthotics and tissue viability.

4 In total, 221 major/minor limb amputations or debridement procedures occurred between 2006–2010. Two years after the study period, the number of major amputations decreased (7 events) compared to 2 years before the study period (12 events).

5 After calculating the total expenditure of the clinic, the authors observed a yearly saving of EUR 114 063 associated with the introduction of the MDFPC.

6 This study was the first to examine the impact of introducing a MDFPC into an Irish hospital setting. The authors concluded that dedicated diabetic foot care teams are both cost and clinically effective in decreasing the rates of foot-related complications in people with diabetes.

Nason GJ, Strapp H, Kiernan C et al (2013) The cost utility of a multi-disciplinary foot protection clinic (MDFPC) in an Irish hospital setting. *Ir J Med Sci* **182**: 41–5

## FOOT (EDINB)

### Insole interventions: A total contact insole can reduce plantar pressures

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

1 Previous research suggests that the reoccurrence of foot ulcers after first ray amputations are particularly high in people with diabetes. Inshoe interventions are often offered as treatment, with the aim to decrease plantar pressure.

2 The authors aimed to evaluate the efficacy of a total contact insole for decreasing plantar pressure in people with diabetes and partial first ray amputations.

3 In total, 20 people with diabetes and a partial first ray amputation on one foot were included in the study. Participants had a mean age of 60 years and a mean BMI of 27 kg/m$^2$. Inshoe plantar pressure with a total contact insole and with flat insole were measured using the Matscan system whilst walking and standing.

4 Tested areas included mid-foot, medial and lateral heel areas, as well as five metatarsal locations.

5 Plantar pressures whilst walking and standing were significantly reduced in tested areas with the use of the total contact insole ($P$<0.05). In comparison, the use of a flat insole was associated with pressure changes only when walking ($P$<0.05).

6 When walking with total contact insoles, highly significant changes in plantar pressures were detected in all areas besides the first metatarsal, when compared with walking with a flat insole ($P$<0.001).

7 The authors concluded that a total contact insole can significantly decrease plantar pressures in people with diabetes and first ray amputations.

El-Hilaly R, Elshazly O, Amer A (2013) The role of a total contact insole in diminishing foot pressures following partial first ray amputation in diabetic patients. *Foot (Edinb)* **23**: 6–10

## J FOOT ANKLE SURG

### High repeat amputation rate associated with DN

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

1 The authors conducted an 11-year retrospective review to investigate the repeat amputation rate following initial partial ray amputation attributable to peripheral diabetic neuropathy (DN).

2 Initial incision healing was observed in all participants ($n$=59) during the mean study period of 33.8 months.

3 Twenty-five months after initial amputation, 25 participants (42.2%) required proximal repeat amputation and 36% required ancillary surgical procedures.

4 Subsequent foot ulcers (mean 3.1) developed in 69% of the cohort. The majority of participants (90%) required numerous courses of antibiotics following a mean of 26.6 clinic visits.

5 Almost half of participants with diabetes and DN had a subsequent proximal repeat amputation, which questions the durability of initial partial ray amputation in this population cohort.

Borkosky SL, Roukis TS (2013) Incidence of repeat amputation after partial first ray amputation associated with diabetes mellitus and peripheral neuropathy: an 11-year review. *J Foot Ankle Surg* **52**: 335–8

## DIABETES CARE

### Diagnosing osteomyelitis

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

1 The authors sought to determine the clinical utility of using $^{67}$Ga single-photon emission computed tomography and X-ray computed tomography (SPECT/CT) imaging to diagnose diabetic foot osteomyelitis in people without soft tissue infection ($n$=55).

2 All foot ulcers were healed in participants that had a negative $^{67}$Ga SPRCT/CT scan ($n$=13) without the use of antibiotics. Of the 40 participants with a positive scan and bone puncture, 24 had Gram-positive infections and 19 had negative results.

3 The authors concluded that $^{67}$Ga SPRCT/CT imaging can accurately detect osteomyelitis when combined with bedside percutaneous bone puncture.

Aslangul E, M'bemba J, Caillat-Vigneron N et al (2013) Diagnosing diabetic foot osteomyelitis in patients without signs of soft tissue infection by coupling hybrid 67Ga SPECT/CT with bedside percutaneous bone puncture. *Diabetes Care* 20 Mar [Epub ahead of print]

## OST WOUND MANAGE

### Hyperbaric therapy ups DFU repair rate

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

1 The aim of this study was to assess the effects of hyperbaric oxygen (HBO) therapy on the healing rate and oxidative stress markers of diabetic foot ulcers (DFU) over a 2-week period.

2 A total of 36 people with DFUs were randomised to receive off-loading and wound debridement ($n$=18) or standard care with two HBO sessions per day lasting 90 minutes ($n$=18).

3 A greater reduction in ulcer size was reported in the HBO group, (42.4% ± 20.0% versus 18.1% ± 6.5%; $P$<0.05) but this was associated with an increase in oxidative stress markers catalase, superoxide dismutase and malondialdehyde ($P$<0.05) after 14 days.

4 The authors concluded that although HBO therapy was associated with ulcer healing, the long-term effects of increased oxidative stress requires further study.

Ma L, Li P, Shi Z, Hou T et al (2013) A prospective, randomized, controlled study of hyperbaric oxygen therapy. *Ostomy Wound Manage* **59**: 18–24

> *"The authors concluded that although hyperbaric oxygen therapy was associated with ulcer healing, the long-term effects of increased oxidative stress requires further study."*