

Lower limb complications

An inconvenient truth



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Despite being fortunate enough to train in Professor Andrew Boulton's unit – a privilege that enabled me to participate in a lot of early basic clinical research in this area – I increasingly find

myself asking why we screen patients' feet for increased risk of diabetes foot ulceration? Is screening actually effective at identifying people at risk of ulceration? Where is the evidence that screening can reduce rates of ulceration or amputation? If there are positive answers to these questions then why does the Quality and Outcomes Framework payments scheme reward practitioners for carrying out screening, but not – like HbA_{1c}, cholesterol or blood pressure – for actually using the result to determine care?

It is easy to determine which risk factors are associated with higher rates of foot ulceration. The literature is full of articles with clear odds ratios and predictive values. Hokkam's (2009; summarised alongside) article once again highlights that being male, having reduced circulation, reduced sensation and, crucially, previous foot ulceration puts a person at increased risk. Hokkam (2009) does take

things a step further and introduces new risk factors for delayed ulcer healing that are interesting and intuitive.

Checking pulses and assessing sensation are, in themselves, relatively simple tasks. Bower and Hobbs (2009; summarised below) clearly demonstrate that most individual tests are performed reliably by trained generalist healthcare professionals, but that the higher level function of formulating a risk assessment is not always performed correctly. Therefore, this function should be performed by experienced specialist healthcare professionals. In the UK, this would be by podiatrists after the initial screening has been performed by other staff.

The problem is that, although people found to be at low risk have a vanishing small risk of foot ulceration in the year proceeding screening, the vast majority at increased risk will not ulcerate either. Furthermore, the majority of those who do develop ulcers will be the group with a history of ulceration. It is, therefore, crucial – until we can further narrow the risk factors for first ulceration – that those with a previous ulcer or amputation are given preferential access to the best podiatric care and are seen as a risk group in themselves.

PRIMARY CARE DIABETES

No foot examination, higher HbA_{1c} and anaemia reduces healing rate

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

- 1 The author sought to identify factors for ulceration, and their impact on patient outcome.
- 2 In an Egyptian secondary care setting, 300 people with diabetes were consecutively recruited (180 with active foot ulceration; 120 controls).
- 3 Participants were examined and interviewed. Data were collected on the traditional risk factors (e.g. sex, age, diabetes duration, glycaemic control, previous ulceration or amputation, ischaemia, neuropathy), as well as chronic illness, regular foot examination, smoking and socioeconomic status.
- 4 Participants were followed-up for a maximum of 6 months. At study end, those with active foot ulceration at baseline were assigned to one of two groups (healed ulcer; persistent ulcer or amputation) and the data were analysed.

JOURNAL OF THE AMERICAN PODIATRIC MEDICAL ASSOCIATION

Validity, reliability of foot screening checklist poor

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

- 1 The authors undertook a study of the validity and reliability of a foot screening tool (FST) in primary care.
- 2 People with type 2 diabetes and impaired glucose tolerance ($n=500$) had their feet screened by a generalist foot screener and a specialist podiatric physician (the latter considered to be the gold standard).

3 Generalist foot screeners were nurses (63.9%), dietitians (19.6%) and bicultural support officers (16.5%) who had undertaken a 1-day National Diabetes Foot Care Training Course.

4 The sensitivity (0.54; 95% confidence interval [CI], 0.50–0.58) and specificity (0.77; 95% CI 0.73–0.81) of the FST were poor.

5 Generalist foot screeners were able to perform individual FST tests with high sensitivity and specificity, but not correctly classify risk.

6 The authors concluded that foot screeners need a screening tool that is sufficiently valid.

Bower VM, Hobbs M (2009) Validation of the basic foot screening checklist: a population screening tool for identifying foot ulcer risk in people with diabetes mellitus. *J Am Podiatr Med Assoc* **99**: 339–47

- 5 As other studies have suggested, male sex, previous foot ulcer, peripheral vascular disease and neuropathy (all $P \leq 0.009$) increased risk. Lack of foot self-examination was also found to independently contribute to foot ulcer risk ($P=0.002$).
- 6 Ulcer outcome was significantly related to diabetes duration, poor glycaemic control, anaemia (all $P \leq 0.006$) and infection ($P < 0.001$).
- 7 The strongest predictors of diabetic foot ulceration were concluded by the author to be peripheral vascular disease, neuropathy, lack of foot examination, poor glycaemic control and anaemia.

Hokkam EN (2009) Assessment of risk factors in diabetic foot ulceration and their impact on the outcome of the disease. *Primary Care Diabetes* **3**: 219–24

JOURNAL OF WOUND CARE

A dynamic care pathway for the structured use of advanced therapies

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

- The authors developed a dynamic care pathway that coordinated the use of three advanced wound care interventions – aiming to provide continuity of care for patients, and a structured protocol for clinicians.
- First, hydrosurgical debridement (HD) of wounds with >20% hydrated devitalised tissue was undertaken. Next, topical negative pressure (TNP; –80 mmHg) was undertaken until the wound bed was 100% granulation tissue. Finally, silver barrier dressings (SBDs) were used until healing was achieved.
- Participants ($n=11$; average age 69 years [range 43–84]) had an active diabetic foot ulcer, mean area that had persisted for a mean of 57 weeks (range 3–364) at enrolment.
- Six participants underwent HD, five required only one episode. TNP was used for an average of 23 days (range 7–138), during which mean ulcer area was reduced –53% (range +6 to –100%). SBDs were applied following TNP for a mean of 164 days.
- One participant was lost to follow-up. All other ulcers achieved complete healing. Treatment duration was a mean of 194 days. A –86% (mean –18 cm²) reduction in ulcer size was achieved by study end.
- The structured and strategic application of advanced wound care technologies to all breaks in the skin of a person with diabetes below the level of the ankle, irrespective of cause, it was argued, would reduce progression to complex chronic wounds and optimise patient outcomes.

Chadwick P, Haycocks S, Bielby A, Milne J (2009) A dynamic care pathway to coordinate the use of advanced therapy in diabetic foot ulceration. *J Wound Care* **18**: 433–7

HEALTH TECHNOLOGY ASSESSMENT

Three dressing types provide same healing

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

- A comparison of the effectiveness and cost-effectiveness of three dressing types: N-A[†], a non-adherent, knitted, viscose filament gauze; Inadine[‡], an iodine-impregnated dressing; and Aquacel[‡], a new hydrocolloid preparation.
- The primary outcome in this multicentre, prospective, observer-blinded, parallel group, randomised controlled trial was the number of ulcers healed at week 24.

- A total of 317 people with diabetes and a foot ulcer were randomly assigned 1:1:1 to the dressing treatment arms; 88 people withdrew.
- No significant difference between the three dressings with regard to percentage healed by 24 weeks (per protocol analysis: Inadine 55.2%; N-A 59.4%; Aquacel 63.0%), or in the mean time to healing, was found.
- The cost associated with the provision of dressings was significantly different, (mean cost/person: N-A £14.85; Inadine £17.48; Aquacel £43.60). The higher cost of Aquacel was not offset by fewer dressings required for that arm.

Jeffcoate WJ, Price PE, Phillips CJ et al (2009) Randomised controlled trial of the use of three dressing preparations in the management of chronic ulceration of the foot in diabetes. *Health Technol Assess* **13**: 1–86, iii–iv
[†]Johnson & Johnson Medical, Berkshire. [‡]ConvaTec, Middlesex.

WOUND REPAIR AND REGENERATION

Ulcer infection score predicts outcome

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

- The authors developed a semi-quantitative 10-item diabetic foot infection scoring system that encompassed wound size and a variety of infection parameters.
- The ability to predict clinical outcome, and the consistency and validity of the scoring system were assessed.

- Participant ($n=371$) data were drawn from SIDESTEP, a prospective diabetic foot infection antibiotic trial.
- A significant correlation was found between clinical response and wound score, with good internal consistency (Cronbach's alpha >0.70 – <0.95).
- The authors found that the exclusion of the items for wound discharge (purulent, non-purulent) – leaving an eight-item score – provided better measurement statistics.
- The wound score also significantly correlate with the validated University of Texas Wound Classification score.

Lipsky BA, Polis AB, Lantz KC et al (2009) The value of a wound score for diabetic foot infections in predicting treatment outcome: a prospective analysis from the SIDESTEP trial. *Wound Repair Regen* **17**: 671–7

DIABETIC MEDICINE

Plantar pressure <200 kPa may reduce reulceration

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

- The authors measured peak plantar pressures (PPPs) among people with diabetic neuropathy who had remained healed after an episode of plantar ulceration to determine a pressure below which ulcer risk is reduced.

- Participants ($n=49$) were enrolled; all had a prior neuropathic plantar ulcer that had been healed for an average of 3.6 years. In-sole sensor arrays measured PPP in shoes, pressure platforms measured PPP for barefoot gait.
- At the site of the healed ulcer, mean barefoot PPP was 556 kPa and mean in-shoe PPP was 207 kPa.
- The authors proposed that an in-shoe PPP of <200 kPa should be the target for people with healed plantar neuropathic ulcers to prevent reulceration.

Owings TM, Apelqvist J, Stenström A et al (2009) Plantar pressures in diabetic patients with foot ulcers which have remained healed. *Diabet Med* **26**: 1141–6

“Generalist foot screeners were able to perform individual Basic Foot Screening Checklist tests with high sensitivity and specificity, although they were less able to correctly interpret the data collected and to assign the correct risk classification.”