

Lower limb complications

DIABETIC MEDICINE



Positive MDRO status does not alter healing time

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

1 This study had two aims: to characterise factors that allow multidrug-resistant organisms (MDRO) to colonise diabetic foot wounds; and to assess the influence of MDRO infection and colonisation on the healing of wounds.

2 Microbiological specimens were taken on admission of 180 people to a diabetic foot unit; risk factors for MDRO-positive specimens were examined and prospective follow-up data were used to assess the influence of MDRO infection/colonisation on time to heal.

3 MDRO-positive admission specimens equated to 18%.

4 MDRO-positive status was not associated with patient characteristics, wound type or wound duration.

5 A multivariate analysis showed that a history of previous hospitalisation for the same wound or the presence of osteomyelitis were the only factors significantly associated with positive MDRO status on admission.

6 In the longitudinal study (of the 75 wounds), MDRO-positive status on admission or during follow-up was not associated with time to heal.

7 Hygiene measures or isolation precautions should be implemented to prevent cross-transmission in diabetic foot clinics and hospitals.

Hartemann-Heurtier A, Robert J, Jacqueminet S et al (2004) Diabetic foot ulcer and multidrug-resistant organisms: risk factors and impact. *Diabetic Medicine* 21: 710-15

You give me fever...



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As I have previously outlined in this section, the management of diabetic foot ulceration has three main tenets: debridement; pressure relief; and infection control. Infection control can be complicated by the choice of systemic vs local therapy, broad vs narrow spectrum and endless speculation about how long to continue antibiotics. Unfortunately there are no answers in this editorial, but there are at least some clues.

Slater et al (below) examine the assumption that superficial swabs are not useful in determining the causative organism in foot infections. By direct comparison of superficial and deep samples they conclude that the microbiological flora of superficial ulcers could be detected by surface swabs in nine of ten cases. However, when the ulcer extends to bone, superficial swabs are accurate in only two-thirds of cases. But their conclusion that swab cultures are valuable is possibly stretching things a little far. After the swab has been taken the interpretation of the results is even more important. It is still hard to pick out the

pathogen from a successful swab with more than one organism. Indeed 'mixed flora of doubtful significance' is a phrase I would have banned from the microbiologist's vocabulary, particularly when the form stated that the swab came from 3 cm into a sinus!

Another reason for not swabbing patients is that they might pick up MRSA (methicillin resistant *Staphylococcus aureus*) and that would give the clinician even more therapeutic dilemmas. Hartemann-Heurtier et al (left) found that 26 of 180 patients in their series had multidrug-resistant organisms (MDRO). Given the current controversy over hospital hygiene, it is perhaps telling that prior hospitalisation (and/or osteomyelitis) was a major predictor of the development of MDRO. Previous studies have suggested that antibiotic use can lead to MDRO selection within the flora of the ulcer. However, I think it is important that, for the second major paper on this subject that I have read in the past year, the presence of MDROs did not influence healing. Perhaps we can get back to treating patients and ulcers, and spend less time and money treating cultures which are worrying in otherwise healing wounds.

DIABETIC MEDICINE



Swab culture not as effective if wound extends to bone

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

1 The objective of this study was to re-evaluate the accuracy of swab cultures vs deep tissue cultures in diabetes wounds of differing severity and depth.

2 Infected diabetic wounds were cultured (n=60) – two specimens were taken from each wound: a superficial swab before debridement and a deep tissue specimen towards the end of debridement.

3 The micro-organisms isolated from the swab specimen and those isolated from the deep tissue specimen were identical in 62% of wounds.

4 The swab culture contained all of the micro-organisms isolated from the deep tissue culture and contained additional micro-organisms in 20% of the wounds.

5 Swabs identified all micro-organisms isolated from the deep tissue specimens in 90% of wounds that did not extend to bone, as opposed to 65% of wounds that did extend to the bone.

6 The researchers conclude that swab cultures are valuable in the identification of pathogens in diabetic foot wounds when bone is not involved.

Slater RA, Lazarovitch T, Boldur I et al (2004) Swab cultures accurately identify bacterial pathogens in diabetic foot wounds not involving bone. *Diabetic Medicine* 21: 1705-9

‘An increasing DEPA score is associated with an increased risk of amputation.’



DEPA system may predict healing

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

- This study examined the validity of a new scoring system in predicting the outcome of diabetic foot ulcers.
- DEPA score includes the Depth of the ulcer, the Extent of bacterial colonisation, the Phase of ulcer healing and the Associated underlying aetiology.
- Of the 84 participants, 32 had a DEPA score of ≤6, 34 scored 7–9 and 18 scored ≥10.
- Spearman's non-parametric correlation test showed that the DEPA scoring system was accurate in predicting the outcome of management at a mean follow-up of 20 weeks.
- People with DEPA score ≤6 had excellent healing, but only 15% of participants who scored ≥10 had complete healing.
- An increasing DEPA score is associated with increased risk of amputation.

Younes NA, Albsoul AM (2004) The DEPA scoring system and its correlation with the healing rate of diabetic foot ulcers. *The Journal of Foot & Ankle Surgery* 43: 209–13

‘The educational programme for GPs did not improve diabetic foot ulcer management.’



GP education had no effect on ulcer outcome

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

- The researchers compared the rate and levels of lower limb amputation (LLA) in people with diabetes performed in their unit between 1989–1993 and 1994–1998 to assess the impact of a training programme initiated for GPs in 1994.
- During the first time period, 132 people with 163 lesions were compared with 176 people with 183



Protective effects of therapeutic footwear: the debate

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

- The evidence for the effectiveness of therapeutic footwear in preventing foot reulceration in people with diabetes and foot risk factors was reviewed, identifying nine published articles related to studies of therapeutic footwear and prevention of reulceration.
- Risk ratios in all studies that assessed the association between therapeutic footwear and reulceration were under 1.0, suggesting protective benefit, but the most rigorous study observed no statistically significant benefit between wearing personal footwear and study footwear.
- Observational studies suggested a significant protective benefit from therapeutic footwear in people with severe foot deformity.
- Studies reporting significant protective effects from therapeutic footwear may have been influenced by design issues.

Maciejewski ML, Reiber GE, Smith DG, Wallace C, Hayes S, Boyko EJ (2004) Effectiveness of diabetic therapeutic footwear in preventing reulceration. *Diabetes Care* 27: 1774–82

- lesions during the second time period.
- Primary healing was 59.1% in the first period and 56.8% in the second, and no change in amputation rate was seen in the two periods.
 - In-hospital mortality rate was unchanged, but the percentage of people who left hospital against medical advice and did not complete follow-up increased from 1.5 to 6.8%.

- The educational programme for GPs did not improve DFU management, perhaps due to lack of motivation, weakness of programme or lack of resources.

Benotmane A, Faraoun K, Mohammedi F, Amani ME, Benkheilifa (2004) Treatment of diabetic foot lesions in hospital: results of 2 successive five-year periods, 1989–1993 and 1994–1998. *Diabetes and Metabolism* 30: 245–50



TAL could reduce ulcer recurrence

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

- This study aimed to determine the effects of tendon Achilles lengthening (TAL) on ambulatory plantar pressures and ankle range of motion, movement and power, and to establish if changes in forefoot pressure after treatment of a neuropathic ulcer are related to changes in ankle dorsiflexion range of motion (DFROM) or plantar flexor (PF) power during gait.
- Participants comprised people with diabetes, equinus deformity and a neuropathic forefoot ulcer treated with TAL and total contact casting (n=14), or total contact casting alone (n=14).
- Pressure and gait tests were performed before treatment, and at three weeks and eight months after treatment.
- The TAL group had an initial decrease in forefoot peak pressure (PP), forefoot pressure-time integral (PTI), PF movement and power, and an initial increase in rear foot PP, rear foot PTI and DFROM.
- Post-surgical changes in rear foot pressure and DFROM were maintained up to 8 months after treatment with TAL; forefoot pressure and PF movement and power increased significantly.
- It was found that changes in forefoot pressure after treatment in either group was correlated with changes in PF power, but not with changes in DFROM during gait.
- TAL may cause a temporary reduction in forefoot pressure by reducing PF power during gait.
- The initial decrease in forefoot pressure followed by the reloading of forefoot tissues may help reduce the risk of ulcer recurrence.

Maluf KS, Mueller MJ, Strube MJ, Engsborg JR, Johnson JE (2004) Tendon Achilles lengthening for the treatment of neuropathic ulcers causes a temporary reduction in forefoot pressure associated with changes in plantar flexor power rather than ankle motion during gait. *Journal of Biomechanics* 37: 897–906