

# How can a skin care protocol benefit management of the diabetic foot?

This report is a summary of the session *How can a skin care protocol benefit management of the diabetic foot?* presented by Matthew Young and Sandra Jones, and held on 18 June 2014 at the 15<sup>th</sup> Annual Scottish Conference of *The Diabetic Foot Journal* in Glasgow.

Dr Matthew Young (Consultant, Edinburgh) opened the symposium with the question: Why is it that only around half of people with diabetes whose feet are at high risk of ulceration have received preventative care (Rayman et al, 2013)?

Simply, this group is “slipping through the net” because, despite being at high risk of ulceration, they are not being referred on for appropriate, preventative care.

While the SIGN guidance (2010) and the Scottish Diabetes Group do include referral in their diabetic foot care pathways for high-risk patients, the Quality and Outcomes Framework does not incentivise referral, regardless of the risk category assigned.

Dr Young stressed that, as clinicians, there are a range of preventative interventions that we can undertake to manage the risk of ulceration, one of which is to ensure the appropriate skin care in at-risk patients, which was the subject of this symposium.

## Callus and the diabetic foot

Skin callus is known to be highly predictive of subsequent ulceration

### Presenters

Matthew Young is Consultant Physician, Edinburgh.

Sandra Jones is Podiatry Diabetes Coordinator NHS Highland.

(Murray et al, 1996). Edmonds et al (1986) assessed 238 ulcers in 148 patients with sensory neuropathy and found 77% of ulcers to be associated with thick callus. Even for ischaemic patients, areas of plantar callus increase the local risk of ulceration (Tyrrell, 2006).

More recently, a retrospective review found that 192 episodes of ulceration (82%) were preceded by minor trauma due to elevated repetitive pressure from hyperkeratosis (Sage et al, 2001) and Baker et al (2005) found that an ulcer was revealed in 80% of cases following removal of blood-stained callous.

Thus, Dr Young stressed that the management of plantar callus is a major issue for people with diabetes at risk of ulceration. Effective removal of callus via sharp debridement was found in one study to reduce plantar pressures by 26% (Young et al, 1992).

Furthermore, Cavanagh and Bus (2010) revealed that debridement of callus was as effective in providing plantar pressure relief as custom-moulded inserts.

Knowing that callus increases the risk of ulceration in this patient population, Dr Young posed the question of what we

can do as clinicians to aid our patients in preventing its development.

## Describing skin changes

There are a number of wound classifications and descriptive scales that have proved useful in the clinical setting (e.g. Texas, SINBAD, PEDIS). However, healthcare professionals are missing a “skin scale” that would enable the clinician to assess foot skin more effectively.

Dr Young and colleagues, supported by Dermatronics Ltd, saw the need for an easily understood, illustrated skin scale that suggested a course of action for each stage on the scale and gave the clinician the ability to record change in patients’ skin over time.

To this end, the Young–Townson Foot Skin Hydration Scale for Diabetic Neuropathy was developed (Young et al, 2014).

Delegates at the conference were provided with copies (*Figure 1*).

Not only does the scale allow for classification, it also provides skin care recommendations based on the classification. Thus, levels 1 and 2 do not have significant callus and therefore can be treated with a standard emollient

***“Why is it that only around half of people with diabetes whose feet are at high risk of ulceration have received preventative care?”***

compliant with a local health board formulary, while levels 3 and 4 require a product with keratolytic properties.

Most emollients have the disadvantage of requiring twice daily application to be effective, and only 27% of patients achieve this frequency (Somroo et al, 2011). Furthermore, around a third of patients take at least 4 minutes to apply skin creams to their feet (data on file, Dermatonics Ltd), making the activity a time-consuming one that is likely to be skipped.

Dr Young stressed that, while failure to undertake potentially limb-saving activities like recommending emollient application might appear illogical to clinicians, it is important to remember that compliance and adherence rates in chronic disease self-care are universally poor.

People with diabetes have a range of activities with which their clinicians ask them to comply: insulin and/or oral medication regimens, meal planning, blood glucose monitoring, exercise adherence, and so on. For example, people with type 2 diabetes have a mean of 8.9 different drug types to take each day (Ibrahim et al, 2005). Furthermore, health education is known to have only a short-term effect on knowledge and behaviour in at-risk patients (Dorresteijn et al, 2012).

### An ideal emollient


Given the difficulty that patients have in applying creams to their feet, and adherence issues, an emollient with a proven, single daily application regimen would be preferred by many, especially among patients whose foot skin falls into levels 3 and 4 of the skin scale. Callused feet at these levels require creams with keratolytic properties and high concentration urea-based creams – such as Dermatonics Once Heel Balm – are particularly suitable for this role

**The Young Townson  
Foot Hydration Scale  
for Diabetic Neuropathy**

**Level 1**

**Well hydrated heels, with little or no signs of drying.**


**Recommended Emollient**  
**Recommend** a standard emollient, preferably with a **ONCE-A-DAY** regime, for prevention



**Level 2**

**Drying skin but no callus.** The foot may have some fissuring but no apparent callus


**Recommended Emollient**  
**Prescribe** a standard emollient preferably with a **ONCE-A-DAY** regime to prevent deterioration



**Level 3 High Risk**

**Drying skin combined with Callus.**  
The foot may have some fissuring but no apparent open splits


**Recommended Emollient**  
**Prescribe Dermatonics Once Heel Balm** due to proven efficacy and **ONCE-A-DAY** regime. Discuss treatment plan with Community Podiatry Service



**Level 4 High Risk**

**Callused skin with open splits.**  
The splits may be wider than those shown


**Recommended Emollient**  
**Prescribe Dermatonics Once Heel Balm** - apply on dry skin and callus but not directly in open splits. Refer to your Community Podiatry Service



For further detail and emollient suggestions please see overleaf

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Figure 1. The Young–Townson Foot Skin Hydration Scale for Diabetic Neuropathy

(Pavicic and Korting, 2006). The erosive properties of salicylic acid-containing creams means they are contra-indicated in people with neuropathy.

Studies have demonstrated that 25% urea creams are significantly more effective than 10% urea creams at hydrating skin and removing callus (Baird et al, 2003).

Furthermore, creams with once-a-day protocols provide convenience to patients and cost savings to the NHS, and Dermatonics Once Heel Balm is the only 25% urea cream with an exclusively once a day application.

In comparison to another 25% urea foot cream, Dermatonics Once Heel Balm was found – in a double blind randomised



Figure 2a. Mr X at presentation. 2b. Immediately after first application. 2c. At 2 weeks. 2d. At 2 months.

study left versus right to be preferred by 94 of the 98 participants, with 96% showing a significant improvement in foot skin quality with no reported safety issues (Dermatonics Ltd, data on file). Thus, to prevent or address callus in the diabetic foot, 25% urea creams are better than 10%, once-a-day application is better than more often and Dermatonics Once Heel Balm has the desired evidence of efficacy and safety.

Dr Young then handed the floor to Sandra Jones (Podiatry Diabetes Coordinator, NHS Highland), who provided case studies on the use of Dermatonics Once Heel Balm in clinical practice.

### Case studies

Ms Jones began by confessing that she had been at a slight disadvantage when asked to present. Despite using Dermatonics Once Heel Balm in her practice for some time, she had no photos of her cases and had to gather together some patients who were new users of Dermatonics Once Heel Balm.

#### Case one

Mr X is a 62-year-old non-smoker who was diagnosed with type 2 diabetes in 2000

(HbA<sub>1c</sub> 50 mmol/mol). He is obese (BMI 50) with a history of gout and atrial fibrillation and takes nine different medications. Mr X is a taxi driver, and lacks time and flexibility because of his job.

He first attended podiatry clinic for a bilateral first mycotic total nail avulsion and phenolisation. Mr X also has a history of fungal skin infection, anhidrosis and fissuring. Diprobase and steroid cream had previously been prescribed by his GP for itchy, dry skin. He was deemed to be at low risk of an ulcer. His skin status was Level 4 on the Young-Townson Scale (Figure 2a).

Ms Jones applied Dermatonics Once Heel Balm for Mr X. He noticed an immediate effect (Figure 2b), saying: “My feet feel so much better.” His wife applied the cream for him every night, as he found this to be the best time to fit with his routine. Significant improvement was seen at 2 weeks (Figure 2c) and he is still using the cream at 2 months (Figure 2d). Mr X remains very pleased with the result, saying: “My feet feel so different,” and noting that it is “much more comfortable to walk”.

Ms Jones notes that it is important clear advice is given to patients on how much

cream to use to gain maximum benefit from the product – overuse can lead to the skin becoming too greasy. She suggests between 2 mL and 4 mL, depending on skin level; a 200 mL tube can last between 3 to 4 months with appropriate use.

#### Case two

Mrs Y is a 59-year-old smoker. A former taxi driver, she has now retired after a significant financial windfall. She is overweight, with a number of chronic conditions, including type 2 diabetes (HbA<sub>1c</sub> 70 mmol/mol).

She has a long podiatry history. Mrs Y does not feel a monofilament at all and is at high risk of developing an ulcer status and has some callus. Her skin status was Level 3.

After 2 months of Dermatonics Once, Mrs Y says she can feel her feet on the floor now and feels more flexible. She says: “This stuff is really good, it goes on every day religiously. My hands feel good as well as my feet. I’m so glad you can prescribe this.”

#### Addition to formulary

Ms Jones then discussed how she, a consultant and a diabetes pharmacist gathered all the evidence and successfully applied to have Dermatonics Once Heel Balm added to the NHS Highland Joint Formulary.

The formulary specifies the product

***“To prevent or address callus in the diabetic foot, 25% urea creams are better than 10%, once-a-day application is better than more often and Dermatonics Once Heel Balm has the desired evidence of efficacy and safety”***

is to be used as part of an individually-tailored foot management plan in conjunction with podiatry care.

For more information and references, Ms Jones pointed to a number of publications about urea creams in *The Diabetic Foot Journal* (Baird et al, 2003; Baker and Rayman, 2008; Mooney, 2011; Bristow, 2013).

In conclusion, daily use of moisturiser is an integral component of diabetes foot care. The cases show that if the product works patients will use it. For maximum effectiveness, clinicians must ensure patients know how much to use.

### Economic benefits

Dr Young concluded with a brief discussion of the economic case for using urea creams in the diabetic foot. Current estimates are that around 40 000 people with diabetes are prescribed a 25% urea cream for Stage 3 and 4 feet. The annual cost of a once a day 25% urea cream exceeds that of a twice a day standard emollient by £7.

There may be as many as 800 000 people with diabetes with neuropathy and dry skin. If they all had callused dry skin and received once a day 25% urea cream, the total additional cost would be £5.6 million per year. In real terms, this prescribing would pay for itself if about 1% of these patients had a reduction in ulcerations, i.e. a reduction of 438 ulcerations (and subsequently 44 amputations).

Prevention is much better than cure for diabetic foot patients, and potentially a lot cheaper too. ■

### Acknowledgement

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Figure 3a. Mrs Y at presentation. 3b. At 1 week. 3c. At 2 weeks. 3d. At 2 months.

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