Diabetes Professional Care® - DPC®
Foot & Wound Clinic

Time Is Tissue

Graham Bowen & Fatima Cassim

DPC 2019

Learning Outcomes

- Understand why the foot in diabetes can progress so quickly
- Understand what makes the foot in diabetes so vulnerable
- Key tips to share with patients to prevent tissue loss
- Why does infection lead to tissue loss
- When to refer on and how you would find out to whom to refer to

Amputation and Diabetes

- 85% of amputations start with a single foot ulcer

Ref: https://*www.diabetes.org.uk/resources-s3/2019-02/1362B_Facts%20and%20stats%20Update%20Jan%202019_LOW%20RES_EXTERNAL.pdf*

- Here to aim to improve outcomes

Diabetes Foot Disease

Delay in Referral

practice

Perception of diabetic foot ulcers among general practitioners in four European countries: knowledge, skills and urgency

Objective: Diabetic foot ulcers (DFU) have the potential to deteriorate rapidly, in the absence of prompt assessment and treatment. The aim of this study was to analyse the awareness and perception of DFU among general practitioners (GPs) from four European countries, and to find possible differences between these countries in terms of management.
Method: A two-part, quantitative, online questionnaire was distributed to GPs across four countries in Europe — the UK, France, Germany and Spain. The first part entailed a survey on the perception and knowledge of the pathogenesis and management of DFU, among GPs. The second part of the questionnaire was used for the collection of data on recently-managed DFU cases.
Results: For the first part of the study, 600 questionnaires were collected (150 per country) and 1198 patient cases of DFU management were included in the second part. In France, only 49% of GPs mentioned neuropathy as the main causative process in DFU development. However, in Germany and the UK, 82% and 83% of GPs, respectively, considered neuropathy as an important causative factor. DFU care in Spain and the UK is thought to be organised by multidisciplinary teams (MDT) (93% and 84% of GPs, respectively, completely agreed with this statement). In France and Germany, GPs are responsible for follow-up and management. Only UK physicians have clearly identified specialised podiatrists to refer patients to, if needed. Approximately 29–40% of GPs in all countries did not feel they were sufficiently trained in the DFU treatment protocol. Almost 30% of GPs in France and Germany thought that DFU treatment was not well-established due to the absence of clinical guidelines and protocols.
Conclusion: The intra-country and inter-country management of the complex aspects of DFU is quite heterogeneous. The cause of this finding is multifactorial. Although there are international guidelines, it would be beneficial to establish clear and specific competencies for the different health professionals involved in DFU management. As a minimum, intra-country heterogeneity should improve with their development.
Declaration of interest: The authors have no conflict of interest to declare with regard to this work.

diabetes mellitus • diabetic foot ulcers • general practitioners

Diabetic foot ulcer (DFU), one of the most important complications in patients with diabetes, can lead to major limb amputation, increase the risk of death, significantly decrease quality of life (QoL) and incur high societal costs.[1,2] The global DFU prevalence in Europe is 5.5%[3] and the annual incidence is around 2–4%, in developed countries.[3,4] During treatment, lower limb amputation, in any form, is performed in nearly 30% of cases.[5]

The most important factors that lead to the development of DFU are peripheral neuropathy (sensory loss, motor disease with foot deformities and autonomic dysregulation), peripheral artery disease and trauma.[6] Ulceration and impaired healing are direct consequences these pathophysiological factors. However, they are not the only concerns for DFU patients. Once a wound is present, the risk of infection will increase, this is the most common precipitating event leading to lower extremity amputation.[4–7] If infection develops, the healing process gets more complicated and limb and/or life could be threatened, especially if deep structures like bones are involved. In some of these cases, although the tissue is infected, common inflammatory signs are absent. The presence of a non-healing ulcer is sometimes the only feature that leads to the suspicion of diabetic foot osteomyelitis. In addition, infected DFU treatment is not always easy and treatment with broad spectrum antibiotics is usually not sufficient. Therefore, accurate ulcer depth assessment, sharp debridement, sampling tissue for culture and offloading are vital for DFU management.[10,11] Vascular and neurological evaluations are also necessary and helpful in the identification of the main mechanism of ulceration. Accurate global DFU evaluation is useful to implement effective treatments and secondary

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TIME to referral

SINBAD

Jeffcoate et al

SINBAB	0	1	Score
Site	Forefoot (0)	Rearfoot (1)	0 /1
Ischaemia	At least on Pedal pulse (0)	Clinical evidence of reduced blood supply (1)	0 /1
Neuropathy	Intact (0)	Not intact 8/10 and less (1)	0 /1
Bacterial Load	None (0)	Present (1)	0 /1
Area	Ulcer < 1cm2 (0)	> 1cm2 (1)	0 /1
Depth	Texas 0 or 1 (0)	2 or 3 (1)	0 /1

TIME to referral

TIME to referral

TIME and WOUND CARE

ENLUXTRA™

TIME* concept expansion with ENLUXTRA

OBSERVED WOUND CONDITION	PROPOSED CLINICAL ACTION	ENLUXTRA ACTION	CLINICAL OUTCOME	ENLUXTRA: ONE PRODUCT FOR ALL ISSUES
T TISSUE: non-viable or deficient	Debridement (episodic or continuous)	Support of intense natural autolytic debridement	Cleared wound bed	✓
I INFECTION and INFLAMMATION	Remove infected tissue Systemic or topical antimicrobials	Physical removal of pathogens and infected tissue from wound bed	Reduced bacterial burden and inflammation	✓
M MOISTURE: imbalance	Remove excess fluids Moisturize dry tissue	Automatic regulation of moisture balance based on feedback from wound	Restored moisture balance in all parts of the wound	✓
E EDGE OF WOUND: non-advancing or undermining	Determine cause Apply corrective therapies: grafts, debridement, biological agents	Correction of T/I/M factors leads to correction of wound edge progress	Advancing wound edge	✓
S SKIN AROUND THE WOUND: dry, scaly, inflamed, macerated, or otherwise compromised	Assess peri-wound conditions Protect peri-wound skin	Protection of peri-wound skin from infection, mechanical damage, maceration and desiccation	Healthy peri-wound skin	✓

*Adapted from Caroline Dowsett, Heather Newton. Wound bed preparation: TIME in practice

Debridement in the Diabetic Foot

- Why is the Diabetic Foot different?
- Cautions
- When you can, when you can’t
- What you can, what you can’t

Non-wound debridement (callus)

- Abnormal stresses caused by pressure and/or friction to areas of the foot with loss of protective sensation can lead to thickening of the stratum corneum.
- Hyperkeratotic lesions (callus) that develop on the plantar aspect of the foot further increase pressure and may carry a high risk for ulceration and infection (Murray et al, 1996).

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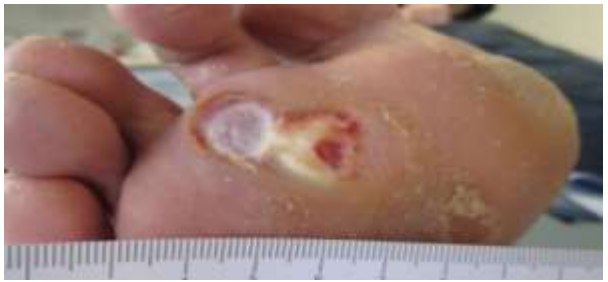


Time

Living well with Diabetes Foot Disease

- 8,760 hours per year
- Patients may only get 3-20 hours with a Health Care Professional….so 8,740 hours on their own
- Know their numbers (BP, Cholesterol, HbA1c)
- Involve others: ‘a team game’ = MDT

NICE NG 19 (2015)

Diabetic foot problems: prevention and management NICE Guideline 19(NG19)
Published: 26 August 2015 nice.org.uk/guidance/ng19

Multi-Disciplinary Teams (MDT)

Diabetes Foot Disease

85% of all diabetes amputations start with a least a single foot ulcer[1]

1. Boulton AJ, Vileikyte L, Ragnarson-Tennvall G, et al. The global burden of diabetic foot disease. Lancet 2005; 366: 1719-1724.

Diabetes Foot Disease

Every 20 seconds a lower limb is lost to the consequences of diabetes

(Diabetes Foot Study Group 2016)

Diabetes Foot Disease

- Diabetes foot disease – on the increase
- Most significant complication and major impact on survival
- Access to the gold standard therapies –

Ref: https://*www.diabetes.org.uk/resources-s3/2019-02/1362B_Facts%20and%20stats%20Update%20Jan%202019_LOW%20RES_EXTERNAL.pdf*

Diabetes Foot Disease

Diabetes Foot Disease

Neuropathic;

Diabetes Foot Disease

Neuropathic;

Diabetes Foot Disease

Neuropathic; Neuroischaemic and Ischaemic

Diabetes Foot Disease Survival

- Five-year mortality rates after new-onset diabetic ulceration have been reported between **43% and 55% and** up to **74%** for patients with lower-extremity amputation.

- *These rates are higher than those for several types of cancer including prostate, breast, colon, and Hodgkin's disease (Robbins et all, 2008)*

Diabetes

- NHS spends £1.6 million per
- 300 MI / 300 CVA and 169 amputations / week (Diabetes UK)
- 700 new T2 / day & 30 new T1 / day

Diabetes

- NHS spends £1.6 million per **hour on Patients with Diabetes**
- 300 MI / 300 CVA and **169 amputations** / week (Diabetes UK)
- 700 new T2 / day & 30 new T1 / day

Diabetes Foot Disease

- **A Major amputation cost £65,000 (Kerr 2014)**






Annual Foot Check

This is an x-ray image of an actual foot in high heels

WHEN CARING FOR YOUR FEET, WHAT SORT OF PROBLEMS SHOULD YOU LOOK OUT FOR?

Damage to your nerves might be indicated by:

- tingling sensation; pins and needles
- pain (burning)
- sweating less
- feet that are red and hot to touch
- changes to the shape of your feet
- hard skin
- loss of feeling in your feet/legs.

Damage to your blood supply might be indicated by:

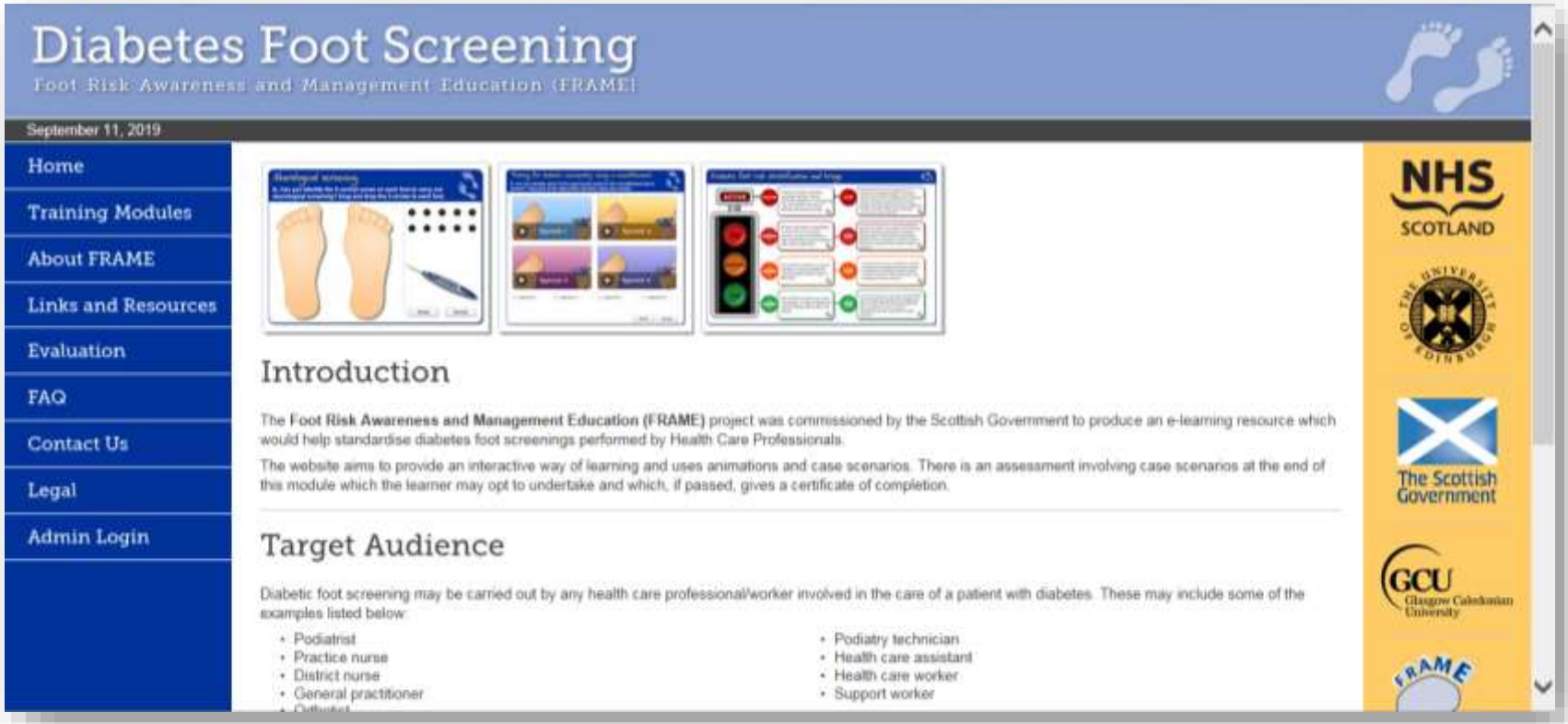
- cramp in your calves (at rest or when walking)
- shiny smooth skin
- loss of hair on your legs and feet
- cold, pale feet
- changes in the skin colour of your feet
- wounds or sores that do not heal
- pain in your foot/feet
- swollen feet.

If you notice any of these things, or have concerns about your feet, tell your GP or diabetes team – do not wait until your annual foot check!

How to Determine the Risk Status of Developing Diabetic Foot Complications

- ✓ Once the annual review tests have been performed the **patient's risk level** can be determined
- **BUT…….they are declining**

Training - FRAME



Active Foot Disease

- Rapid referral (within one working day) to the Foot Protection Service (FPS) or the multidisciplinary foot team, for triage within one further working day..

All amputations preventable?

Key information

- The presence of callus over weight-bearing areas of the foot in the presence of peripheral neuropathy is a high risk factor for developing ulceration – increasing the risk by up to 77%

- The presence of **blood-stained callus** and **neuropathy** is considered to be highly predictive of ulceration, with it reported as being present in up to 80% of reported cases after callus has been removed

SINBAD

Use of the SINBAD Classification System and Score in Comparing Outcome of Foot Ulcer Management on Three Continents
Paul Ince, et (2008) **Diabetes Care**

SINBAD	0	1	Score
Site	Forefoot	Rearfoot	0 /1
Ischaemia	At least on Pedal pulse	Clinical evidence of reduced blood supply	0 /1
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SINBAD score	Time to Heal
0-2 Moderate	Up to 77 days **(£4,000 per year) M Kerr 2016**
3-6 Severe	Range126-577 days **(£17,000 per year) M Kerr 2016**

NICE NG 19 (2017): Diabetic foot problems: prevention and management

Treatment

1.5.4 Offer 1 or more of the following as standard care for treating diabetic foot ulcers:

- **Offloading**
- **Control of foot infection (if required)**
- **Control of ischaemia (if required)**
- **Wound debridement**
- **Wound dressings**

Figure 5: The pillars of DFU standard of care with the addition of evidence-based local wound care (Wounds UK, 2018)

Education (WoundsUK)

CPR and Prevention

1. **C**heck
2. **P**rotect
3. **R**efer

- Amputations are preceded by ulceration
- Ulceration occurs under hard skin
- Hard skin can be prevented

National Diabetes Foot Audit 2017

Outcomes

- Only 54.1% offer 24 hour access
- 77.4% have a dedicated pathway high risk diabetic foot

Outcomes, Results and Findings

Patient characteristics What were the characteristics of patients at assessment ?	Ulcer characteristics What were the patients' ulcer characteristics at assessment?	Alive and ulcer-free What proportion of ulcers were healed after 12 and 24 weeks?	Alive and ulcer-free How do outcomes relate to ulcer characteristics and the time to assessment?	Ulcer healing What characteristics are associated with being alive and ulcer-free?
The average patient was age **67 years** and had diabetes **15 years**. 13 per cent had Type 1 diabetes, and 87 per cent had Type 2 diabetes. **43 per cent** met the NICE HbA1c ≤58 mmol/mol target.	Almost **half** of ulcer episodes were graded **severe** (SINBAD ≥ 3) at assessment (46 per cent). **3 per cent** of ulcers had signs of **active** or **possible** Charcot foot disease.	**One third** of people still had ulcers and almost **one in twenty** had died 24 weeks after assessment.	People with **less** severe ulcers were almost **twice** as likely to be alive & ulcer free at 12 weeks (60 vs. 35 per cent)	Worse ulcer healing was associated with having **any** of the 6 SINBAD elements, having **Charcot** foot disease and not being seen for **2 months or more**.
		People seen within **two weeks** are more likely to be alive and ulcer-free than those seen later.		

The full annual report and local level reports can be found at: http://www.digital.nhs.uk/pubs/ndfa1516

www.digital.nhs.uk
enquiries@nhsdigital.nhs.uk
0300 303 5678

Diabetes Foot Disease

3b. Associations: Time to first expert assessment

Commentary

The evidence derived from over 33,000 new diabetic foot ulcers suggests that early referral is associated with better outcomes at 12 weeks; ulcer severity is higher amongst those that wait the longest.

NDFA team

Recommendation

All people with diabetic foot ulcers should be referred promptly for early specialist assessment, in line with NICE guidance[5].

Notes: 5. Please refer to list of footnotes in the Footnote section.
Please see Glossary for explanation of terms

41

https://www.hqip.org.uk/wp-content/uploads/2019/05/National-Diabetes-Foot-Care-Audit-fourth-annual-report-FINAL.pdf

National Diabetes Foot Audit 2018 Outcomes

2b. Results: Outcomes

Commentary

The audit has consistently found that ulcer severity is strongly associated with worse patient outcomes, including:

- Lower healing rates.
- More/longer hospital admissions.
- Higher major amputation rates (above the ankle).
- Higher mortality rates.

The NDFA survival curves show that 1 in 7 people with severe ulcers die within one year of assessment, rising to almost 1 in 4 for those with ischaemia.

NDFA team

Recommendations

To minimise the severity of diabetic foot ulcers at first expert assessment:

Patients with poor circulation (peripheral artery disease or **ischaemia**) or loss of feeling (**neuropathy**) should seek advice from their GP or usual diabetes carer about how to prevent foot ulcers.

Patients with **new foot ulcers** should seek **quick referral** from a healthcare professional to a local specialist diabetes foot care service.

Providers should ensure that people with diabetic foot ulcers are referred promptly for early specialist assessment, in line with NICE guidance.

Commissioners should ensure that NICE-recommended structures of care are in place.[31]

https://www.hqip.org.uk/wp-content/uploads/2019/05/National-Diabetes-Foot-

Referral

Prompt referral of an acute diabetic foot to a diabetic foot pathway is key

Risk Factors of Diabetic Foot Disease

“WIFI OFF”

- **W**ound
- **I**schaemia
- **F**oot **I**nfection
- **O**ffloading

Risk Factors of Diabetic Foot Disease

“WIFI OFF”

- Wound
- **Ischaemia**
- **F**oot **I**nfection
- **O**ffloading

Risk Factors of Diabetic Foot Disease

“WIFI OFF”

- Wound
- **I**schaemia
- **Foot Infection**
- **O**ffloading

Risk Factors of Diabetic Foot Disease

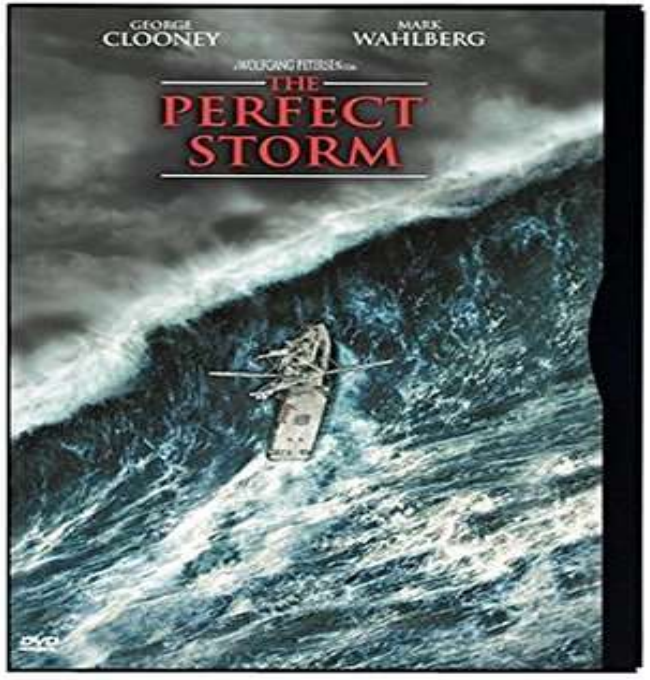
“WIFI OFF”

- Wound
- **I**schaemia
- **F**oot **I**nfection
- **Offloading**

Red flags

Diabetes Foot Disease: TIME

- Numbers increasing
- Costs increasing
- Access to health care
- Workforce declining



Questions