A new audit scheme with a difference: The foot care module of the National Diabetes Audit

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At some stage in the next 6 months we are planning to launch the new Foot Care Module of the National Diabetes Audit (NDA). The aim is that every team looking after active disease of the foot in diabetes (ulcers and/or Charcot – not painful neuropathy) across England and Wales will start to include every new referral that they see. The data entry will be minimal (our hope is that it can be recorded in 60 seconds; submission will be online). The baseline information will then be linked to data from other parts of the NDA. Participants will be able to measure and compare outcomes before and after correction for other patient characteristics.

The ultimate aim is to reduce the massive variation in the incidence of major amputation in in people with diabetes, with data from England published in 2012 showing a 10-fold difference between PCTs (Holman et al, 2012). But the prime aims of the audit are threefold: to determine if:
• Nationally recommended foot-care service structures are in place.
• Treatment complies with national recommended guidance.
• The outcomes of treatment are as good as they can be.

Factors known to relate to the incidence of major amputation

We already know that in England and Wales two factors definitely link with a high rate of limb loss: (a) greater social deprivation; and (b) a higher proportion of white Caucasians in the population (because amputation is about half as common in Blacks and only about as quarter as common in South Asians). We also know that the incidence of major amputation is higher in people with more severe lesions at presentation [Armstrong et al, 1998, Ince et al, 2007; 2008).

We suspect, however, that other factors also contribute and these include aspects of the structure of the service (such as the availability of a skilled multidisciplinary team [MDT]) and the process of care (such as the speed of referral for expert assessment), but we need more information.

How will we manage to reduce the data entry burden for each new referral?
1. Structure of care services
Information on the structure of services (e.g. the existence of an MDT, and of a Foot Protection Service – both to be defined) will only be collected each 1–2 years from service managers.

2. Case-mix: Patient demographics
We will be able to get all the information we need on age, gender, disease duration, treatments, ethnicity, etc from the NDA, which currently collects data on 88% of all people in England and Wales with known diabetes by direct electronic download from GP and specialist systems (Health & Social Care Information Centre, 2013). The only item that needs to be collected in order for these data to be linked for analysis is the NHS number.

3. Case-mix: Lesion type
Lesions will be classified/scored using two methods:
(a) Has the person got underlying Charcot (yes/no/possibly), and if 'yes', is it acute or chronic?
(b) Using the SINBAD system (Ince et al, 2008; *Table 1*).

Table 1. The SINBAD classification/score of foot ulcers (Ince et al, 2008).

Site	Forefoot	0	Hindfoot	1
Ischaemia	No	0	Yes	1
Neuropathy	No	0	Yes	1
Bacterial infection	No	0	Yes	1
Area ≥1cm^2	No	0	Yes	1
Depth* - Deep?	No	0	Yes	1
Total score				0–6

*Deep = University of Texas Grades II–III (reaching to tendon, joint capsule, or bone), or Not Deep = University of Texas Grades 0–I.

Clinicians who took part in the pilot study generally found this system very easy to use. The SINBAD system allows classification of the ulcer by **S**ite (forefoot/hindfoot), **I**schaemia (based on pulses), **N**europathy (simple clinical tests), **B**acterial infection (clinical), **A**rea ($\geq 1cm^2$) and **D**epth (not deep [University of Texas Grades 0–I] or deep [University of Texas Grades II–III]). The SINBAD classification can also be used to give an overall score of severity, with scores of >3 known to be associated with worse outcome. This has been validated on three continents (Ince et al, 2008).

4. Speed of referral

Clinical staff will be asked to determine the time elapsed between a new lesion being first seen by a healthcare professional, and the time to first assessment by an expert. The elapsed time will be categorised into one of four groups (<2 days; $\geq$2 days but <2 weeks; $\geq$2 weeks but <2 months; >2 months)

Data from both the UK and the USA indicate a clear link between ulcer duration and ulcer area and between both of these and time to healing (Margolis et al, 2002; Ince et al, 2007).

5. Clinical outcome

This will be determined in two ways:
• Data collected by cross-linkage with other databases, using NHS number. Data on hospital admissions, length of stay, and amputations will be available from hospital episode statistics (HES in England; PEDW in Wales), and data on death will be obtained from the Office of National Statistics.
• Data collected by clinic staff (*Table 2*).

The use of the specific measure of "being alive and ulcer-free" will reflect both speed of ulcer healing and prevention of short-term recurrence or new ulceration.

Analyses

These data will allow several clinical outcomes to be reported (and not just amputation) before and after allowance for known and potential confounding factors (e.g. age, sex, ethnicity, deprivation, severity at presentation, type of diabetes, weight, glucose control) and it will clarify associations with both the structure and the process of care.

In addition, it will be possible to identify from HES/PEDW all people who have been admitted for a foot ulcer in diabetes and/or undergone major or minor amputation. It will then be possible to determine if these clinical outcomes are different between audit participants and non-participants.

Conclusions

This work will give clinical teams a set of reliable measures on which to base their improvement programmes. It will enable clarification of the links between aspects of care organisation and clinical outcomes. It will help establish improved patterns of clinical management, and thereby refine and validate clinical guidance.

What audit is and what audit is not

Audit is designed to provide reliable clinical measurement for improvement. It can explore how care can be optimised and can reveal best practice by exploring differences between communities. It is not about finding fault or pointing the finger of blame. That is why we all need to embrace the process because we all need to learn just which practice produces the best outcome. And, to be honest, none of us currently knows whether we are any better than anyone else – despite the extent of our commitment. We need to find out.

And so, what's the difference then?

It is that for very little effort by us all, this new audit scheme will make a real short term difference to the quality of foot disease in diabetes. It offers the potential for a system that could be adopted also in other countries, leading ultimately to a large scale improvement in clinical outcome of disease of the foot.

Finally, a challenge

We are looking for a catchy acronym. The best we have got so far is FOCACCIA but feel it's both a bit of a mouthful (Ha! Ha!) and a bit foody-posh. It needs to be snappier. Suggestions by email to lindsey. mathews@woundsgroup.com. We'll give a prize for the suggestion which goes on to be adopted.

Acknowledgements

Table 2. Data to be collected by clinical staff as part of the planned new National Diabetes Audit Foot Care Audit.

(a) At presentation
1. Identity
　NHS number
2. Case-mix
　• SINBAD classification/ score
　• Is there underlying Charcot disease ?
　　If 'yes', is it acute or chronic?
3. Process
Elapsed time between first assessment by a healthcare professional and first assessment by a member of a specialist multidisciplinary team:
<2 days
$\geq$2 days but <2 weeks
$\geq$2 weeks but <2 months
>2 months

(b) Outcome of each episode of active disease
• Is the person alive and ulcer-free (even after any amputation) at 12 weeks?
• Is the person alive and ulcer-free (even after any amputation) at 24 weeks?

Armstrong DG et al (1998) *Diabetes Care* **21**: 855–9
Health & Social Care Information Centre (2013) National Diabetes Audit. Available at: http://www. hscic.gov.uk/nda (accessed 07.12.2013)
Holman N et al (2012) *Diabetologia* **55**: 1919–25
Ince P et al (2007) *Diabet Med* **24**: 977–81
Ince P et al (2008) *Diabetes Care* **31**: 964–7
Margolis D et al (2002) *Diabetes Care* **25**: 1835–9