In its latest analysis, the National Diabetes Foot Care Audit has assessed the impact of diabetic foot disease on hospital admissions. Steve Chaplin examines the audit results and their implications for the current quality of diabetes care.

The National Diabetes Audit (NDA) is one of 30 clinical audits conducted by the NHS. It is commissioned by the Healthcare Quality Improvement Partnership, which is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. It is funded by NHS England and the Welsh Government with additional contributions for specific aspects from Scotland, Northern Ireland and the Channel Islands, and prepared in collaboration with Diabetes UK and supported by Public Health England.

The purpose of the NDA is to help the NHS improve the quality of diabetes care in England and Wales. It provides the data by which the NHS can assess local practice against NICE guidelines and quality standards, compare services and outcomes with the results delivered by similar organisations elsewhere in the country, and identify and share best practice.

Diabetic foot disease is associated with high morbidity and mortality and a substantial demand on NHS resources. The first report of the National Diabetes Audit programme to assess the quality of NHS foot care in England and Wales, published in 2016, made grim reading. Forty percent of responding centres could not say whether they had all of the recommended services in place and more than 40% did not offer all of the three basic NICE recommended systems for preventing and managing diabetic foot disease. Almost 30% of patients self-presented; of those who did not self-present, about 40% did not see the foot care service for at least two weeks after their first health care contact about their ulcer. This audit definitively established the relationship between ulcer severity and healing outcomes (Table 1) and the association between delay in the first expert assessment of a foot ulcer and delayed healing (Table 2).

### Table 1. Ulcer severity and outcomes: data from the first NDA diabetes foot disease audit. (Copyright © 2017 Healthcare Quality Improvement Partnership)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Less severe</th>
<th>Severe*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seen within 2 weeks</td>
<td>62%</td>
<td>58%</td>
</tr>
<tr>
<td>Healed at 12 weeks</td>
<td>60%</td>
<td>35%</td>
</tr>
<tr>
<td>Healed at 24 weeks</td>
<td>74%</td>
<td>56%</td>
</tr>
</tbody>
</table>

*SINBAD score ≥3

### Table 2. Time to first expert assessment and healing: data from the first NDA diabetes foot disease audit. (Copyright © 2017 Healthcare Quality Improvement Partnership)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Short wait (≤2 days)</th>
<th>Long wait (&gt;2 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% with severe ulcer</td>
<td>50%</td>
<td>58%</td>
</tr>
<tr>
<td>Healed at 12 weeks</td>
<td>48%</td>
<td>32%</td>
</tr>
<tr>
<td>Healed at 24 weeks</td>
<td>68%</td>
<td>54%</td>
</tr>
</tbody>
</table>

### National Diabetes Foot Care Audit results

In its latest analysis, the National Diabetes Foot Care Audit (NDA) assesses the impact of diabetic foot disease on hospital admissions. It notes that over 64 000 people with diabetes in England and Wales have foot ulcers. The risk of lower extremity amputation for people with diabetes is 20 times greater than for those without diabetes and approximately 7000 leg, foot or toe amputations are carried out in England annually. Five-year survival for people with diabetes who have a foot ulcer is about 60%; worse, only half of those who have a leg amputation live for two years. The cost of diabetic foot disease to the NHS in England was around £1 billion in 2014–15—a figure that does not take into account the personal and social costs of living with the condition.

The N DFA report for 2014–16 shows what the NHS delivered for that investment. It addresses four audit questions on hospital admissions, foot disease-specific admissions, revascularisation, and lower limb amputation. By linking patients in the N DFA population with Hospital Episode Statistics for England and the Patient Episode Database for Wales, it analyses hospital activity in the six months following the first expert assessment of an ulcer by the specialist foot care service during the 21 months between 14 July 2014 and 8 April 2016. This is the first time these data have been linked and analysed. The data were provided by 173 specialist foot care services in 114 NHS trusts and health boards, involving 11 703 patients with 13 034 new foot ulcer episodes and 12 806 admissions within six months of their first expert assessment. Length of stay data exclude day-case admissions.

Diabetic foot disease was defined as ‘a foot affected by ulceration that...’
is associated with neuropathy and/or peripheral arterial disease of the lower limb in a patient with diabetes’. Admissions were identified by searching for relevant diagnoses (Box 1) and for the procedures ‘debridement of a foot/leg wound’ and ‘minor and major amputation of a lower limb’. Foot disease could have been identified at any point during a hospital stay; there may have been more than one admission and/or foot disease type per patient and other morbidities may have contributed to the admission or hospital stay.

The NDFA estimates its case ascertainment rate at only 10–20%. It raises this issue after comparing its ascertainment rate with the NDA report on complications and mortality for 2015/16, which identified 1520 patients admitted for major amputation in England and Wales compared with 153 in the NDFA report; the corresponding figures for minor amputation are 3448 and 631 respectively. This means that the audit population may not fully represent the national picture, and morbidity, mortality and resource use may be underestimated – in particular, numerical estimates for bed days may be out by a factor of 10. This disparity was also noted in the 2014/15 report and was perhaps attributable to incomplete participation in what was the first such audit of foot care.

What proportion of people with a new foot ulcer have a hospital admission?
The management of diabetic foot disease ‘should as far as possible be an outpatient activity not requiring a hospital stay,’ the NDFA notes. Half of all patients with diabetes who had a foot ulcer were admitted (for all diagnoses) at least once within six months of their first expert assessment. Severe ulcer (SINBAD score ≥3) was associated with a statistically significantly higher admission rate (61% vs 40% with less severe ulcer).

The reasons for admission (primary diagnosis) were varied and, as would be expected in this population, included endocrine disorders, skin disorders, diabetic eye disease and genitourinary disorders for 39% of admissions, but also circulatory disorders (16%) and musculoskeletal conditions (11%); 29% were ‘unclassified/other’. These admissions were associated with an estimated total of almost 96 000 bed days, about two-thirds of which were for patients with severe ulcers, whose median length of stay was seven days compared with five days for those with less severe ulcer.

What proportion of people with diabetic foot ulcers have foot disease-related admissions?
About one in five of the admissions were primarily due to foot disease – a total of 4012 admissions due to 5166 disorders among 2485 patients (Figure 1). Patients who had a severe ulcer were three times more likely to be admitted for any cause than someone with a less severe ulcer (34% vs 11%).

Foot ulcer admissions accounted for nearly 47 000 bed days. Median length of stay was higher when foot disease was the primary diagnosis on admission compared with other diagnoses, reaching seven days for less severe ulcers and 10 days for severe ulcers.

What proportion of people with diabetic foot ulcers have a revascularisation procedure?
There were 1021 admissions for 913 patients (8% of all patients with foot disease) who underwent 1306 procedures. Angioplasty accounted for 81% of procedures, with open procedures (9%) and vascular bypass (10%) making up the remainder. Patients with more severe ulcers were significantly more likely to undergo revascularisation, with 12% admitted for a procedure compared with 4% for those with less severe ulcer. The frequency of type of procedure was not affected by ulcer severity.

Admission for a revascularisation procedure accounted for an estimated 14 576 bed days, 75% of which were associated with angioplasty. The median length of stay for angioplasty or open procedures was nine days but 15 days for bypass only.
What proportion of people with diabetic foot ulcers have a lower limb amputation?

The number of patients having any amputation was 973, or 8% of all patients with a foot ulcer. This was associated with about 1100 admissions and 1200 procedures. Below the ankle amputations accounted for most procedures, affecting 85% of patients undergoing amputations and accounting for 84% of admissions. But that still leaves a total of 211 patients who underwent 225 major amputations within six months of having an expert assessment of their feet. Further, the NDFA report again reminds readers that the true figure could be 10 times higher.

Severe ulcers were almost four times more likely to lead to an amputation. Of all patients with a less severe ulcer, 3.2% had a minor amputation and 0.8% had a major amputation. The corresponding figures for those with a severe ulcer were 12% and 3%. This was a statistically significant difference and one that was reflected in the figures for hospital stay. Amputations accounted for 18 579 bed days with a median length of stay of 14 days. Of these, 65% were due to the much more frequent minor amputations, with a median length of stay of 12 days. By contrast, the median length of stay for major amputation was 25 days.

Summary of impact on length of stay

Statistics are useful for quickly describing outcomes but they mask the wide variations between patients. Figure 2 shows that the consequences of foot disease for a minority of patients are far greater than for most, with some enduring lengths of stay of three to six months. A quarter of admissions involving major amputation lasted ≥40 days and a quarter of admissions for any reason lasted over two weeks.

Conclusions and recommendations

The NDFA concludes ‘there is a clear association between ulcer severity at first expert assessment and likelihood of admission for inpatient foot disease management’. Prevention is clearly preferable to cure – and the other outcomes described in this report – but foot care, as with many other aspects of diabetes care, suffers from ‘appreciable variation between services’ in ulcer prevalence.

Given that ulcer severity is associated with the length of time before expert assessment, access needs to improve in some localities to catch up with performance in the best. Reviewing variation in service provision, the 2014/15 foot care audit noted: ‘It is concerning that there appears to be a lack of awareness about the basic provision of foot care services for a condition with such a major impact on patients and the NHS.’ This report reveals the consequences, and the NDFA recommends that services should ensure that local pathways ‘minimise the time taken to see an expert multidisciplinary foot treatment team’.

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References
