Using the National Diabetes Inpatient Audit to evaluate the delivery of diabetes education

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Abstract
Evaluation of diabetes education is difficult. This is particularly so when a beneficial clinical outcome may be seen as just a result of good clinical care. The added value of an approach to care using diabetes education concepts is then difficult to see. We believe our diabetes specialist care inpatient team does not only provide focused regular care to patients; the team also intends to educate patients, non-specialist health care professionals, and ourselves.

We have used audit standards derived from the questions and answers of the National Diabetes Inpatient Audits (NDIAs) for 2009–2011 to evaluate our performance as diabetes educators in the inpatient setting of a small district general hospital in Wessex. The results are favourable. Likewise, we have compared the performance in the 2010 NDIA of five acute trusts, including our own in Wessex, relating diabetes nurse specialist time available, and the presence of a dedicated team, to quality outcomes.

Finally, we discuss some broad concepts of delivering diabetes education to inpatients and non-specialist health care professionals, trained or in training; we also suggest some possible modifications to the NDIA to strengthen its use as an evaluation tool for diabetes education in the inpatient setting in secondary care. Copyright © 2013 John Wiley & Sons.

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Key words
diabetes education; evaluation; inpatients in acute trusts; National Diabetes Inpatient Audits; derived audit standards; diabetes specialist care inpatient team

Introduction
Diabetes education remains difficult to define and its outcomes have always been hard to separate from those of diabetes care processes alone. This makes evaluation of diabetes education interventions all the more difficult.

This article discusses what diabetes education in the inpatient setting may be; who may be involved; how it is done and when in the context of care delivery. We then explore whether the National Diabetes Inpatient Audit can be used as an evaluation tool for diabetes education as part of care delivery by a diabetes specialist care team in the inpatient setting. Increasingly, secondary care physicians and specialist nurses are being challenged as to their value in diabetes care and education, and the studies reported and commented upon here may be seen as beneficial evaluations of diabetes education in the inpatient setting.

Those health care professionals (HCPs) – be they consultant physicians or junior doctors in training, specialist nurses, or dietitians responsible for the production of, and revision of, specialty specific guidelines and protocols – may be seen as delivering diabetes education in the inpatient setting. This, together with frequent, perhaps daily, visits to the emergency medical assessment unit, may be all that these HCPs are expected to do for the education of patients with diabetes in their acute trust. This, of course, puts diabetes education firmly in the acute care model and all the more difficult to separate from good medical care in its evaluation. In addition, this mode of HCP and patient therapeutic relationship is in line with acute trusts’ and commissioners’ desires and demands to keep patients out of hospital or, if they are admitted, to reduce length of stay. Whether diabetes education and diabetes care delivered in this way are carried out by individual HCPs working alone or in a diabetes specialist care inpatient team will vary from trust to trust, as, indeed, will the professional satisfaction of individuals working in this mode.

How diabetes education is delivered, in any setting let alone the inpatient one, will vary from the structured fully evaluated programmes like DESMOND and Xperi\textsuperscript{1,2} to experiential on-the-job learning opportunities. In secondary
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<table>
<thead>
<tr>
<th>Standard</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription errors</td>
<td>RCH/WEHCT</td>
<td>NDIA average</td>
<td>RCH/WEHCT</td>
</tr>
<tr>
<td>Medication management errors</td>
<td>5%</td>
<td>19%*</td>
<td>11.4%</td>
</tr>
<tr>
<td>Appropriate blood glucose monitoring</td>
<td>3%</td>
<td>14.8%*</td>
<td>18.6%</td>
</tr>
<tr>
<td>Good diabetes days</td>
<td>100%</td>
<td>86%</td>
<td>95%</td>
</tr>
<tr>
<td>Positive experience of diabetes care</td>
<td>83%</td>
<td>73%*</td>
<td>85.5%</td>
</tr>
</tbody>
</table>

*p<0.05 (RCH/WEHCT vs NDIA average).

Table 1. Levels of achievement of audit standards derived from National Diabetes Inpatient Audits 2009–2011 at Royal Hampshire County Hospital / Winchester and Eastleigh Health Care Trust (RCH/WEHCT)

Two studies to evaluate inpatient diabetes education

The idea of an annual National Diabetes Inpatient Audit was proposed by Diabetes UK in 2009 and first carried out in that year and annually since in NHS hospitals. As already alluded to, it is as much a survey as an audit which asks questions under three main headings about inpatient diabetes care on a particular day of the year. From these questions, 14 answers – related to patient safety issues – may be used as audit standards (although none were officially set), and eight – related to the patient experience – may also be used in this way.

Indeed, in Study 1 (described below) we have used these derived audit standards as a means of evaluating the effectiveness of our Diabetes Specialist Care Inpatient Team as educators.

In addition, the NDIA collected and reported some demographics related to patients (numbers by type of diabetes, age, ethnicity, mode of admission) and HCPs, i.e. nursing time available for inpatient care. These we comment on in Study 2 (below) using data from five acute trusts in the Wessex Region of the South Central Strategic Health Authority.

Study 1
Methods. We formed a multi-professional Diabetes Specialist Care Inpatient Team (the ‘team’) at the Royal Hampshire County Hospital (RCH), formerly the Winchester and Eastleigh Health Care Trust (WEHCT), in 2006. We proactively seek out and visit all patients with diabetes in the acute hospital on two morning rounds each week. Our work has been reported previously as having an effective shortening of inpatient length of stay for all patients in the hospital with diabetes as a secondary diagnosis.

Our philosophy of care has included the concept that every interaction of an HCP team member with a patient, or between HCPs, is an opportunity for education in a two-way process – as well as delivering clinical care and establishing an effective therapeutic relationship with the patient, between team members, and with non-specialist HCP colleagues. The NDIA of 2009–2011 have been used to evaluate our effectiveness as educators in this inpatient setting against audit standards derived from the NDIA questions as discussed above.

Results. These are shown in Table 1 which indicates the levels of achievement of an audit standard derived from the NDIA questions for 2009–2011. For each year in turn, our level of achievement was compared with the national average reported and for ourselves over the three years.

Conclusions. We believe that having our dedicated multidisciplinary team using our philosophy of education...
has enabled us to perform as well as, if not better than, the national averages in the NDIs of 2009–2011. The team is multi-professional and multi-functional with interchangeable roles. This adds to the effectiveness of our education of patients and non-specialist HCP ward colleagues, as well as our learning and development of teamwork skills based on mutual professional respect.5 We are proactive in seeking out patients on our regular ward rounds which aids communication with all HCPs and patients. However, noting our own fluctuations in performance in the audits from year to year, we recognised the educational principles of reinforcement and repetition of learning both for ourselves in team meetings, and on the wards through the use of the ‘Think Glucose’ campaign and promotion of the safe-use-of-insulin e-learning module.

Study 2
Methods. The Wessex Diabetes and Endocrine Association (WDEA) is our local multidisciplinary professional body which has met at least annually since 1976. Members agreed to the collection and analysis of some of the NDIs’s derived audit standards for 2010 which were presented at the Wessex Diabetes and Endocrine Association 2012 clinical meeting.7

Particularly pertinent questions relating to the provision of inpatient diabetes specialist care are: the demographic measure of time available from diabetes inpatient specialist nurses or DNSs per average number of patients per working week; the percentage of patients remembering a visit from a diabetes-trained HCP independent of the NDIA day; and the qualitative overall patient satisfaction score.

Data from five acute trusts were used. Three were smaller trusts with less than the NDIA average percentage of inpatients with diabetes, and the two larger trusts had well over 100 patients on survey day.

Results. These are shown in Table 2; the results are anonymised except for RHCH/WEHCT (Trust 1). No statistical analysis has been applied, but there are some clear trends. The acute trust with the formalised in-patient team (Trust 1) had a much higher percentage of patients recalling a visit from a specialist team member than the other acute trusts, and the NDIA average. This trust and the other two smaller ones had the highest patient satisfaction scores, and their minutes of specialist nursing time were approximately twice the national average, and almost three times that of the acute trust with the lowest specialist nursing time. The differentiation into diabetes inpatient nurse specialist time and DNS time is not clearly defined in the NDIA, and it is likely some specialist nurses play either role whether they are in a formalised team or not as well as other diabetes-related specialist nursing. No measures of doctor time were asked for in the NDIA 2010 whether trained, in training, or non-specialist.

Conclusions. A reasonable conclusion from these trends in the results is that the smaller acute trusts with more specialist nursing time are able to offer a better quality of service to inpatients with diabetes, and perhaps particularly when focused through a team like ours using educational methods and a philosophy as described here.

Discussion
Evaluation of the hopefully positive effects of diabetes education has always been difficult, and may have led some to dismiss diabetes education as inconsequential, if its effects exist at all outside good clinical care. This, of course, is music to the ears of those who control the resources, money, time and people coming into our specialty. We have been told8 we simply must try harder and do better to show the value of diabetes education. Even the structured education programme known as DESMOND, into which evaluation was built in a clinical scientific way rather like a randomised controlled clinical trial, struggled to produce highly statistically significant differences in favour of this form of diabetes education.9

We may be judged as being scientifically naive in our attempt to bring quantitation into a qualitative field by evaluating our inpatient service outcomes against the NDIs, especially since some of the questions have changed subtly each year. Furthermore, we have projected into this clinical process the nebulous concept of diabetes education and our philosophy within it as an important factor in producing good results. Was it not just the fact that a dedicated, cohesive team of trained specialist HCPs did regular and predictable ward rounds in a small district general hospital (DGH), seeking out patients and the staff who nursed them, that made the difference? Some would say that is some of what diabetes education should be about when working in

<table>
<thead>
<tr>
<th>Question</th>
<th>Trust 1</th>
<th>Trust 2</th>
<th>Trust 3</th>
<th>Trust 4</th>
<th>Trust 5</th>
<th>NDIA average</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of people with diabetes/percentage of total no. of inpatients</td>
<td>45/13.8%</td>
<td>46/12.7%</td>
<td>33/11.7%</td>
<td>119/14.3%</td>
<td>144/14.6%</td>
<td>–/15%</td>
</tr>
<tr>
<td>Overall patient satisfaction</td>
<td>1.6</td>
<td>1.6</td>
<td>1.5</td>
<td>1.1</td>
<td>1.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Percentage of patients recalling visit by health care professional (HCP) or HCP team during stay</td>
<td>92.7%</td>
<td>29%</td>
<td>20.7%</td>
<td>15.6%</td>
<td>24.6%</td>
<td>30.6%</td>
</tr>
<tr>
<td>Minutes of diabetes inpatient nurse time/diabetes nurse specialist time (mean no. of minutes per patient per week)</td>
<td>56/0</td>
<td>49/0</td>
<td>57/7</td>
<td>30/2</td>
<td>17/0</td>
<td>26/10</td>
</tr>
</tbody>
</table>

Table 2. Selected National Diabetes Inpatient Audit (NDIA) 2010 results for 5 acute trusts in Wessex, and NDIA average for each derived audit standard, where Trust 1 is Royal Hampshire County Hospital/Winchester and Eastleigh Health Care Trust
second primary care in the inpatient setting. We are convinced that the way in which we work as a team using this approach is beneficial to patients, to non-specialist colleagues of all grades and disciplines, and to ourselves.

We believe we have demonstrated this effectiveness in the studies reported here and previously cited. In larger acute trusts with more inpatients, especially if a proactive approach is taken, a single consultant physician and DNS will not be sufficient lead staffing. Then, 'working differently' by all members of the team, trained or in training, may be necessary to implement such a model as ours.

Our proactive team approach is not the only way in which to deliver effective diabetes inpatient care. Flanagan et al. have published on both general diabetes inpatient care10 using a team, and on the diabetes management of a large DGH’s elective surgical admissions using a DNS led approach.11 Davies et al. also reported on the effectiveness of a hospital diabetes specialist nursing service, although neither its work nor its working pattern was the same as that reported by Flanagan et al.12

Many HCPs reading this article and involved in diabetes inpatient care may be using these methods or something similar, and may indeed feel that their results in the NDIA reflect their staffing and work pattern. Perhaps the NDIA should include more about whether a trust has an inpatient diabetes specialist team, who is in it, and what its work pattern is, rather than just giving a figure for DNS time and, as in the 2011 audit, consultant time.

An even more subtle question would be whether HCPs believe that they are delivering education as well as a service to inpatients and non-specialist colleagues, and what methods they may be using. We have described our education type as proactive, but much is also opportunistic. By this we mean using the presenting clinical situation for on-the-job or experiential learning, and teaching and learning by example.

Two questions and therefore derived standards in the NDIA relate to prescribing errors and medication management errors; our good overall performance is not just because we have introduced a mandate to do the safe-use-of-insulin e-learning module, but because on the ward rounds we also teach, by example, insulin and oral hypoglycaemic agent prescribing and dose adjustment.

Assessment is now an important part of any training programme and our model of education fits well with the workplace-based assessments (WpBAs) of junior doctors in training. As important as what education is being delivered and by whom, may be the type of educator the person is and, indeed, if they are aware of such a concept. An interesting poster presentation from the Steno Institute, discussed at the 2011 EASD conference in Lisbon, raised the question of what type of diabetes educator individuals are. The proposed types had been recognised by those carrying out the study from their observations of educators on a teaching programme.

It would seem important that all those working in an education and training role – which most specialised, trained HCPs are doing whether they are aware of this or not and whether it is by design or example – should know their type of educational provision; this has more than a philosophical importance. Perhaps in future NDIA the inclusion of questions and concepts, such as those discussed here, will make the audits more robust; the questions/concepts could be used in order to attempt to evaluate not just service outcomes but also the delivery of diabetes education in the inpatient setting – as we have tried to demonstrate here.

Acknowledgements
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Declaration of interests
There are no conflicts of interest declared.

References