Innovative hypoglycaemia care pathway for admission avoidance: a partnership approach with a local ambulance trust

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Abstract  
In 2010, Leicester City Primary Care Trust commissioned an Intermediate Care Diabetes Service. One aspect of the service plan was to work with the local ambulance trust to gather data around patients using ambulance services for hypoglycaemia, and to provide an advisory service for individuals post ambulance call-out. This audit identified 388 diabetic emergency ambulance call-outs locally (for the period 1 September 2010 to 31 March 2011) including those for hypoglycaemia in the Leicester City area.

The new service commissioned by Leicester City included diabetes specialist nurse assessment within two working days for all hypoglycaemic individuals accessing ambulance services. A care pathway was drawn up and agreed over a series of meetings between the Intermediate Care Diabetes Service and ambulance service leads. Copyright © 2013 John Wiley & Sons.

Key words  
hypoglycaemia; diabetes admission avoidance; ambulance call-outs; diabetes specialist nurse

Introduction  
Hypoglycaemia is the most common diabetes-related cause of ambulance call-out and is associated with increased morbidity and mortality.\(^1\) Most hypoglycaemia episodes are managed by patients and by the ambulance services, and these account for about 90 000 call-outs per year in the UK.\(^2\) Recent figures demonstrated that ambulance call-outs cost the NHS £13 million per year based on a unit cost applied to the estimated number of cases.\(^3\) Every time someone is admitted to hospital because of hypoglycaemia, it costs the NHS about £1000.\(^4\) The cost for people with diabetes experiencing hypoglycaemia is difficult to estimate but can lead to loss of productivity, work days and confidence. Even mild episodes of hypoglycaemia which can be treated without third-party assistance can result in the individual increasing blood glucose monitoring and reducing diabetic medication in order to avoid a repeated event.\(^5\)

In 2010, Leicester City Primary Care Trust (PCT) commissioned an Intermediate Care Diabetes Service (ICDS). Included in the service specification was the requirement to work with the local ambulance trust to gather data around patients accessing ambulance services for hypoglycaemia, and to provide an advisory service for individuals post ambulance call-out. Local audit identified 388 diabetes-related emergency ambulance call-outs in the Leicester area, but these were coded generically as diabetes patients and were not identified as hypoglycaemic events (during the period 1 September 2010 to 31 March 2011).

The new service commissioned by Leicester City included diabetes specialist nurse (DSN) assessment within two working days for all hypoglycaemic individuals accessing ambulance services. A care pathway was drawn up and agreed over a series of meetings between ICDS, ambulance service leads and managers from the ‘Single Point of Access’ (SPA) service (Figure 1). The new service was advertised and promoted to GPs, nurses and community services through existing communication channels such as emails, flyers, planned education sessions, and clinical governance and journal club meetings.
The pathway

Attending paramedics gave patient information leaflets on hypoglycaemia and on the service offered by the ICDS to the affected individuals. All consenting individuals were referred by the paramedics via the telephone to the SPA service who passed on the patient details by fax to the ICDS.

The DSN telephoned each of the referred patients to discuss the episode of hypoglycaemia, offering advice and suggesting treatment changes if required in an attempt to prevent hypoglycaemia recurrence. All individuals were also offered the opportunity to attend a face-to-face appointment following the phone call. Any patient not contactable by phone was automatically sent a DSN appointment. Letters were sent to the patient’s GP following all consultations and if the patient did not take up the offer of an appointment.

Patient demographics, medication and consultation details were recorded on an existing computerised diabetes notes system. Retrospective data were collected from the hospital system and patient records (including number of patients seen, number of contacts, demographics, clinical and admission data). The team felt this would give the first signs of the service effectiveness.

2010–11 audit: aims

These were to audit the number of individuals referred to the service, the mean number of contacts, and their demographic and clinical details including medication and HbA1c results prior to admission.

We also wanted to evaluate the number of patients requiring admission to hospital in the days following DSN input and any admissions for hypoglycaemia within 30 days of the initial ambulance call-out.

Method

Data were collected using hospital systems and patient records including the number of patients seen, the number of contacts, demographics, and clinical and admission data.

Forty (85%) individuals were treated with insulin alone, five (11%) were treated with oral therapies only, and two (4%) were on insulin and an oral therapy. We were unable to make initial contact with six individuals (15%). The average time to contact by DSN was within one working day. The mean number of contacts per patient was 1.32, with telephone contacts accounting for 83% of the total; the ratio of telephone contacts to
face-to-face was 4.6–1. Six patients had face-to-face contacts; four (9%) patients did not attend booked face-to-face appointments. Of the 47 patients referred, none were admitted in the first 48 hours following the intervention; eight were admitted in the 30 days following the intervention of whom only two were hypoglycaemia related – the first was a direct result of hypoglycaemia (sulphonylurea treated) and the second was a case of ethanol poisoning and hypoglycaemia.

**Discussion**

Ensuring that all paramedics working across Leicestershire and that all staff working at an SPA centre used the new pathway was not easy; it quickly became clear that the numbers of referred patients were very low compared to the national average, so not all ‘hypo’ call-outs were being referred. It is not clear why this was the case; it certainly took some time for all staff, including the paramedics and SPA staff, to become familiar with the new process. This issue was addressed to some extent through several joint working meetings with the ambulance staff and telephone contact with managers of the SPA team. It may be that some individuals did not give verbal consent, but this information was not recorded.

The service was extended to patients in the county of Leicestershire in 2011 as we found that there was service inequity – indeed, a postcode lottery for access to ‘hypo advice’. The referral numbers from both areas have increased to 192 in the year 1 April 2011 to 31 March 2012; an audit of this work is currently in progress.

The initial contract with the PCT stated that a DSN should contact the patient within 48 working hours of the referral. In reality, the contact was usually made within the first 24 hours of the call-out. The number of patients where the HbA1c was below 58 mmol/mol (7.5%) was of concern and perhaps reflects tighter glycaemic targets aimed for prior to new Quality and Outcomes Framework guidance. The amount of any additional work and patient contacts for the DSNs was not estimated nor costed in the original contract with the City PCT and the new work with county patients was also not evaluated in respect of workforce hours.

This short audit demonstrated an additional cost in DSN manpower hours of approximately 1 hour per day over seven months, totalling 210 hours. New commissioning processes about to be developed in Leicestershire will ensure this work is evaluated appropriately and measured against the estimated cost of ambulance call-out and admission.

The success of this service has led to plans for a number of new initiatives; these include the piloting of the development and implementation of a more comprehensive patient-centred information booklet commissioned by the East Midlands Ambulance Service. Each individual will now also be offered free access to the NHS Diabetes ‘Safe management of hypoglycaemia’ e-learning module. This new work will audit 100 call-outs and provide a service evaluation; each call-out for hypoglycaemia will be coded as such and individuals who call out the ambulance service for hypoglycaemia will need to ‘opt out’ of DSN referral by contacting the diabetes nursing team within 24 hours. While the ‘opt out’ clause may seem controversial, it could be argued whether consent obtained immediately following third-party assistance for hypoglycaemia is really ‘informed’ consent as most often the individual’s cognitive function would be impaired. Enabling patients to ‘opt out’ within a 24-hour time span ensures that they have the time and information needed to really consider their options. Short telephone patient-satisfaction surveys will be made to all individuals accessing the service and this will investigate whether the ‘opt out’ system is favourable to patients. The complete ‘hypoglycaemia’ pathway has also been revised so that all patients attending the Acute Medical Unit at Leicester Royal Infirmary will have access to DSN input.

**Conclusion**

This unique pathway offered ambulance services a practical and effective alternative to hospital attendance for patients with hypoglycaemia, as evidenced by the low number of hospital admissions in those accessing the service. Since its inception, several other trusts have explored and implemented similar services.

The implementation of this service has resulted in a strong ongoing partnership with the East Midlands Ambulance Service and now with NHS Diabetes. The integrated approach to care will ensure that every individual experiencing hypoglycaemia and seeking medical and ambulance staff support will have access to a medication review and education.

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**Declaration of interests**

There are no conflicts of interest declared.

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