

A seven-day diabetes service for inpatients and the emergency department in an acute hospital setting – the East and North Herts Diabetes Outreach Team (DOT)

Authors: Andrew Solomon,^A Stella George,^A Samer Al-Sabbagh,^A Jalini Joharatnam,^A Debbie Stanisstreet,^B Anne Currie,^B Dawn Hardy,^B Carolyn Jones,^B Manjumol Abraham,^B Lynn Barker,^B Bev Summerhayes,^B Margaret Ford,^B Linda Chapman,^B Laura O'Donnell,^B Felicity Kaplan,^A Ken Darzy,^A Ben Zalin^A and Peter Winocour^A

ABSTRACT

There is evidence that all hospital-based care needs to improve across 7 days. Inpatients with diabetes require better specialist attention and improved clinical outcomes. The East and North Herts inpatient diabetes service has responded to this challenge with care now delivered by consultants and diabetes nurses, 365 days per year. We set out to provide a prospectively measurable improvement in ascertainment of appropriate patients alongside a 'care bundle' to ensure they receive a better quality experience. We also set out to document quantifiable changes in clinical data. A seven-day service is now in place and provides a variety of benefits to both professionals and patients alike.

KEYWORDS: Inpatient diabetes, seven-day service, patient safety

Introduction

The care of patients in the hospital setting is a seven days a week, 365 days a year activity. Detailed analyses of acute admissions in the UK have suggested current adverse clinical outcomes for patients at weekends.¹ The medical director of the NHS England, the secretary of state for health, along with the Royal College of Physicians, have all concluded there is a need for a seven-day provision of services achieving care at weekends that can equate with weekdays.

Some larger trusts run specialty takes and will thus have a diabetes and endocrine consultant on-call 24/7, with a presence in the hospital during the day to review new patients and post-take patients. There is already consultant-led activity for acute medical services seven days a week, but not to our knowledge for concurrent specialist consultant and diabetes-nurse delivered care. Therefore, at present, most acute services utilise clinical guidelines administered by nonspecialists to manage diabetes-related emergencies and new presentations of diabetes out of hours and at weekends.

Authors: ^Aconsultant physician, East and North Herts Diabetes Outreach Team; ^Bdiabetes specialist nurse, East and North Herts Diabetes Outreach Team.

Inpatients with diabetes as a comorbidity have a higher mortality compared with those without diabetes, as well as a longer length of (hospital) stay (LoS).² There is evidence that specialist management of inpatients with diabetes is necessary and improves patient safety,³ but requires further refinement.^{4,5} Improved outcomes could ensure that 'maladministration of insulin' is a 'never event', could support patients presenting with diabetic emergencies and assist with those requiring perioperative care. In England, available National Inpatient Diabetes Audit (NADIA) data, for example, has highlighted high rates of insulin-prescribing errors, and suboptimal patient experience, often where there was insufficient access to specialist inpatient diabetes support.⁶

The most recently published NADIA data for our acute trust in 2012 demonstrated that, despite regional cardiac, vascular surgical and renal units, the amount of time spent per inpatient with diabetes and the proportion visited by a member of the team was lower than the national average. In terms of patient safety data, insulin errors and the incidence of hypoglycaemia were also highlighted. An increase in standardised mortality ratio 'with diabetes comorbidity' was also identified. Based on these findings, we developed a business case to ensure an expansion of diabetes specialist nurse (DSN) and consultant personnel to focus more on diabetes inpatient care.

A portfolio of collaborative guidelines for managing inpatients with diabetes have been produced by the Joint British Diabetes societies (JBDS), to which our Trust contributed.⁷ Hyperglycaemia pathways and the development of a Prevention of Admission (POA) protocol for nonspecialists has enabled emergency and acute medicine physicians to manage and safely discharge patients where appropriate.^{8,9} It includes initiation of insulin by internal medicine physicians, for continuation by a diabetes nurse the following morning.

The solution – enabling the seven-day service

Audits of patients presenting with diabetic ketoacidosis (DKA) and in-hospital patient safety data prompted us to move forward to a seven-day system. Therefore, the inpatient diabetes service of the Trust has been supported (from 2013 onwards) by a Commissioning for Quality and Innovation (CQUIN) dedicated to diabetes. This CQUIN reports quarterly and initial data have shown

progress towards the end of year 1 (Q1/Q2/Q3/Q4), with ongoing data collection for follow-up occurring through to the end of year 2.

Our Trust currently provides care on two acute sites (with over 700 beds) based in East and North Hertfordshire. A diabetes outreach service providing five-day hospital-wide care with consultant and DSN input started in October 2013, following the recruitment of two additional consultant colleagues and a fourth inpatient DSN. The full seven-day service started in January 2014. This amounted to a total of eight consultants accredited in general (internal) medicine (GIM), diabetes and endocrinology, in the department, all of whom support the consultant medical on-call rota, and with an increased provision of DSNs bringing the total to 10 (6.4 whole-time equivalents).

A specified consultant and DSN were allocated for each weekend and bank holiday to ensure a presence seven days a week, 365 days a year. This team proactively review inpatients with diabetes through a system of handover, in addition to relevant new weekend admissions. The initiation of the seven-day service was interlinked with an increase in the total number of consultant physicians on call for medicine at weekends from two to three. There are separate, parallel consultant rotas for cardiology, gastroenterology and nephrology. Given that three consultant physicians are on duty for GIM each weekend, a rota incorporating n=24, with eight available for diabetes, we can enable a consultant in diabetes and endocrinology to be present every weekend.

From a DSN perspective, the Trust has four inpatient-focused DSNs, and six who are more outpatient based, (total n=10). A programme of internal training and monitoring provided a consistent level of capability for core inpatient diabetes functions that all 10 DSNs now deliver. DSNs were also consulted about the plan in terms of their working patterns to include a one in 10 weekend (with a four-hour scheduled shift 08.30–12.30 Saturday and Sunday and bank holidays), as a new aspect to their job plans. It was agreed that the following Monday would be provided as compensatory time off.

The DSN obtains referrals as a first point of contact, using a dedicated bleep number, and then liaises closely with the consultant; together they coordinate the patients to be seen at the weekend. The service benefits from electronic databases and a Trust-wide shared-drive that enable clear communication among colleagues.

There was no additional funding allocated for the increased seven-day service, but it was an expected manoeuvre as part of the CQUIN of the Trust for inpatient diabetes care.

Data collection and statistical analysis

Data were collected prospectively by an audit facilitator collecting data whose base location is independent of that of the clinical team. Statistics were generated using the Chi-squared test.

Outcomes

The seven-day service, which started in January 2014, had its first quantifiable data available at the end of quarter 4 (Q4) of the year, thus incorporating January–March 2014.

To date, the handover system from the weekday inpatient diabetes team to the weekend consultant and/or DSN (and the reverse on Monday) has worked well. Patients newly admitted with DKA, severe hypoglycaemia and/or extreme hyperglycaemia were seen by a consultant in diabetes +/- DSN within 12 hours of arrival, 7 days a week. Approximately five to eight patients on each Saturday and Sunday were reviewed by a consultant, a DSN or both.

Preliminary data from the weekend activity have been analysed and are shown in Table 1. We now have evidence that patients are as likely to see a member of the diabetes team if admitted at the weekend compared with during the week. A mean of two patients per day with a presenting problem related to diabetes could be managed without an overnight stay. These could be described as being examples of admission avoidance and, thus, can be estimated in terms of a significant potential annual cost saving.

Length of stay

For patients admitted with a diabetic emergency, initial data are encouraging with a change in LoS from 6.7 to 6.1 days, and we intend to gather more data to undertake statistical analysis (Table 2).

In addition, it appears that the differences between the day when patients are admitted and the length of stay are becoming increasingly similar, and approaching the average LoS nationally for nondiabetic acutely admitted patients.

Conclusions and next steps

We believe that our seven-day service has been effective to date. The provision of a rota-based system for consultants and DSNs was not difficult to design and clarified core functions of the clinicians' key activities. It helped provide a 'level playing field' of patient care throughout the week that had internal clarity and consistency across the diabetes team.

In terms of issues, and possible criticisms, the amount of time allocated on weekends for consultant (four to eight hours each day) and DSN (eg four hours each shift) cover was not designed from data gathering but simply estimated, taking into account what possible sessional times would need backfilling during the week. In addition, it is not known whether there was variability in quality of care delivered by those consultants and DSNs who deliver inpatient diabetes as part of their 'regular weekday' job compared with

Table 1. Outcomes related to the impact of the enhanced inpatient diabetes service.

Outcome	Baseline (pre-seven-day service) (%)	Q4 results – derived from Q4 of Year 1 (to date of publication; includes seven-day service) (%)
Total patients with diabetes seen by DOT	<30	60 ***
Patients with inappropriate duration of intravenous insulin	27	0 ***
Patients who had foot assessment on pilot ward	0	96 ***
Patients satisfied with their involvement in own their care	40	71 ***

*** p<0.05 – significant difference between pre- and post-seven-day service. DOT, diabetes outreach team.

Table 2. Comparison of length of stay and weekday/weekend difference after introducing the enhanced service.

Outcome	Baseline (pre-seven-day service)	Q4 results – derived from Q4 of Year 1 (to date of publication; includes seven-day service)
Mean length of stay overall (days)	6.7	6.1
Mean difference in length of stay between weekday (Mon–Fri) and Weekend (Sat/Sun) admissions (using a slightly different methodology to overall mean)	0.4	0.3

others, or vice versa. Also, further clarification is needed of which patients need to see either a consultant or DSN (or both).

The next steps are to audit formally the clinical outcomes for diabetes emergencies (eg DKA resulting from the new service in relation to weekdays versus weekends and to match activity records to timings to see whether more, or perhaps less, DSN and consultant time needs to be allocated to the weekend shifts.

Learning points

- > Seven-day services for hospital-based diabetes care can be provided if adequate staffing levels are in place.
- > Developing the service needs careful working pattern design for consultants and DSNs.
- > Weekend working ‘smoothes’ out the peaks and troughs of activity sometimes found during the week.
- > Clinically led improvements in patient care, such as these, can be positively motivating for a clinical department, with an almost immediate impact. ■

References

- 1 Freemantle N, Richardson M, Wood J *et al.* Weekend hospitalization and additional risk of death: an analysis of inpatient data. *J R Soc Med* 2012;105:74–84.
- 2 Valabhji J. Excess inpatient mortality for those with diabetes in England. *Diabet Med* 2013;30:1391–2.
- 3 Flanagan D, Moore E, Baker S *et al.* Diabetes care in hospital—the impact of a dedicated inpatient care team. *Diabet Med* 2008;25:147–51.
- 4 Draznin B, Gilden J, Golden SH *et al.* Pathways to quality inpatient management of hyperglycaemia and diabetes: a call to action. *Diabet Care* 2013;36:1807–14.
- 5 Rutter CL, Jones C, Dhataria KK *et al.* Determining in-patient diabetes treatment satisfaction in the UK—the DIPSat study. *Diabet Med* 2013;30:731–8.
- 6 Diabetes UK, 2013. www.diabetes.org.uk/About_us/News_Landing_Page/National-Diabetes-Inpatient-Audit-highlights-shocking-failings-in-hospital-care/ [Accessed 7 August 2014].
- 7 Association of British Clinical Diabetologists, 2014. www.diabetologists-abcd.org.uk/JBDS/JBDS.htm [Accessed 7 August 2014].
- 8 Herring R, Russell-Jones DL, Pengilly C *et al.* Management of raised glucose, a clinical decision tool to reduce length of stay of patients with hyperglycaemia. *Diabet Med* 2013;30:81–7.
- 9 Association of British Clinical Diabetologists, 2013. www.diabetologist-sabcd.org.uk/JBDS/JBDS_IP_Admissions_Avoidance_Diabetes.pdf [Accessed 7 August 2014].

Address for correspondence: Dr Andrew Solomon, Department of Diabetes and Endocrinology, Lister Hospital, Coreys Mill Lane, Stevenage, Hertfordshire, SG1 4AB. Email: andrew.solomon@nhs.net

Join the discussion online






www.linkedin.com/company/royal-college-of-physicians
www.twitter.com/rcplondon
www.youtube.com/rcponline
www.facebook.com/royalcollegeofphysicians



Royal College of Physicians

