Reconfiguration of DSN record keeping within a clinical workstation

Rosemary Gorrod, Anne M. Keogh, Bernie Stribling, Trevor A. Howlett

ARTICLE POINTS

1 The DSN recording system was reviewed and automated.

2 The new system included the standard clinical workstation, records and data of patient contact, specific DSN contact dataset and free clinical text notes.

3 An audit provided electronically generated data about DSN activites and care.

4 The multidisciplinary team now has access to DSN information regarding patient's clinical and educational status, current problems and concerns.

KEY WORDS

- DSN
- Reconfiguration project
- Electronically generated data
- Multidisciplinary team
- Robust management support

Rosie Gorrod is a Diabetes Nurse Specialist at Leicester Royal Infirmary (LRI); Anne Keogh is a Nursing and Healthcare Consultant at Clinical Solutions Ltd, Leiceser; Bernie Stribling is a Service Manager Diabetes at LRI; and Trevor Howlett is a Consultant Physician at LRI.

Introduction

In order that collection and analysis of data for clinical governance and audit does not become hugely time-consuming and costly, as much as possible of the data collection process should be automated. Increasingly, care professionals should be able to rely on information systems to support them in undertaking specific care activities with individual patients and in the operational management of those care services. This paper describes a change project undertaken by a group of DSNs to reconfigure their DSN records and provide an electronic record that could be accessible to all members of the diabetes team.

Within the Department of Diabetes and Endocrinology at the Leicester Royal Infirmary (LRI), the DSN role is very well established. Set up in 1951, it was the first diabetes department in the country to pioneer a community-focused DSN service.

Background

In 2001, we identified that information about DSN clinical activity was not being recorded in the hospital's information systems. Documentation of clinical assessments, interventions and outcomes was not recorded on the entire patient caseload and some of the DSN documentation was inaccessible by other members of the multiprofessional team. Government initiatives to improve quality of patient care provided the impetus for the LRI DSN team to reconfigure their records to provide an electronic record, accessible to all members of the diabetes team.

An electronic patient record (EPR), 'Leicester Clinical Workstation', which had been established within the department for nearly a decade, was used by medical staff at each consultation to record clinical data, for audit and research and was responsible for all routine correspondence. A project was therefore initiated, using external facilitation and training to review the current DSN recording system with a view to incorporation within the clinical workstation.

Aims

The aims of the project were multifaceted: improving the quality of record keeping to facilitate audit as required by the clinical governance agenda (Bevan and Bowden, 2001; Department of Health, 2001a) necessitated the capture of data of DSN activity in terms of clinical/educational assessment, intervention and outcome. Additionally, improved accessibility to this information by the multiprofessional team was considered essential to promoting integrated care (Stevenson et al, 2001). Finally, it was hoped to identify good practice and care deficits in order to facilitate benchmarking for best practice and research (Johnson, 2001).

Methods

Development of data set

In consultation with the DSN team, the project lead identified a comprehensive list of all types of educational, problem solving and therapeutic activity which were undertaken by the DSN team. This was rationalised and developed into series of datasets consistent with the underlying data model of the clinical workstation. After review by the team and piloting of draft versions, these datasets were integrated into the clinical workstation software.

Resource needs

Computer availability in relevant clinical areas was assessed. Funding for additional

PC hardware and for training was obtained with robust management support.

Organisation and delivery of training

DSN staff varied widely in their experience of using computers and information systems. A pre-training questionnaire was designed, circulated and analysed to assess the training needs of staff and thereby allow training tailored to the needs of each individual.

Training was delivered in a 2-hour session, involving two nurses (or specialist dietician) per session to ensure active participation. Clinical workstation manuals were provided to back up training sessions. A demonstration system was used for practice prior to data entry on the live patient system. Correct entry was assessed and rectified using a competency based post-training programme prior to live use.

Nurse activity was tracked throughout the project. Alterations to the DSN programme to improve its quality were made as became apparent during its use. Training and supervision requirements were reviewed before live use.

The electronic patient record

The 'Leicester Clinical Workstation' (LCW) is a patient-centred clinical information system, currently in use in a broad range of departments at LRI. Its central functions include a clinical record of problems, diagnoses and treatments, with linked specialist datasets that provide a summary of clinical information to clinicians at the patient interface.

Production and storage of all clinical correspondence is integrated within the system, which can also be used to store and print short clinical notes, drug charts, patient information sheets, departmental treatment protocols, inpatient preliminary discharge letters and detailed history and examination documents. All these data are available for rapid analysis for audit, research and the information needs of clinical governance.

The system is linked to demographic data in the hospital patient administration system (PAS), results in the laboratory and radiology reporting systems, and standard 'Office' applications such as Microsoft Word and Excel.

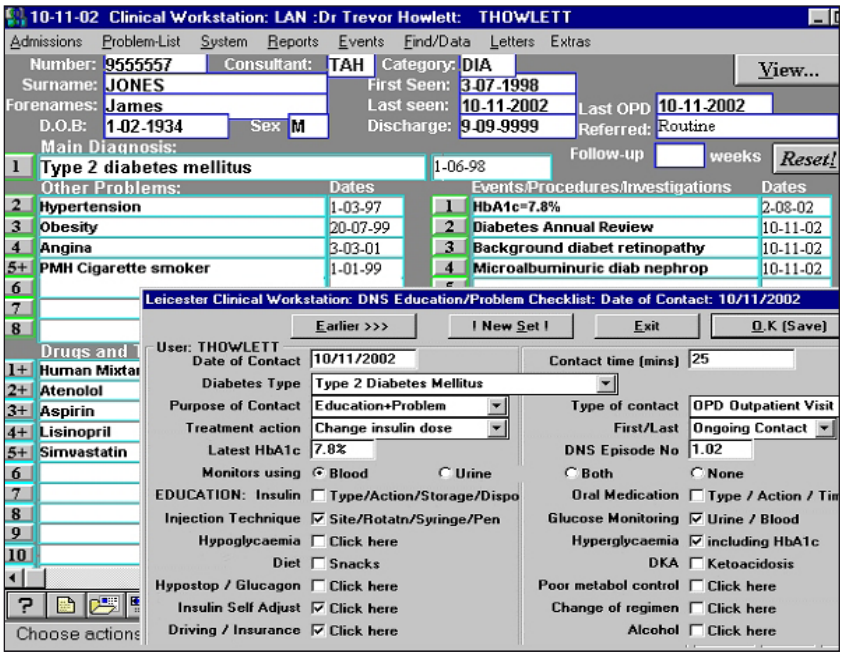

Figure 1. The main Leicester Clinical Workstation screen and part of DSN dataset.

All key clinical items, including diagnosis, problems, procedures and drugs, are validated and stored within the workstation database. Data that consist of items that are not 'clinical terms' are recorded in additional generic, user-definable data tables.

Access to all workstation data is controlled by the hospital network login, with resource availability controlled for each user. Individual passwords are required and regular password change is enforced at login to address confidentiality issues.

The new DSN system included:

- The standard clinical workstation problem, drug and investigation list used by the multidisciplinary team, enabling the DSN to update problems, treatment, drug dose changes and investigation results (Figure 1).
- Facilities for recording the date, location and personnel involved in every patient contact, including inpatient and outpatient consultations and telephone calls, as well as cancellation or non-attendance. Recording of the main 'reason for consultation' is prompted as the activity is recorded. Source of new patient referrals is recorded at first patient entry.
- Specific DSN contact dataset including a checklist of problems, educational items and interventions.

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Table 1. Main diagnosis recorded in LCW of patients seen during audit period

Type of diabetes	Saw DSN	Not seen by DSN	Total
Type 1 diabetes	341 (23%)	548 (27%)	889 (25%)
Type 2 diabetes	920 (62%)	1227 (60%)	2147 (61%)
Gestational diabetes	6 (0.4%)	36 (2%)	42 (1%)
Unspecified diabetes	103 (7%)	39 (2%)	142 (4%)
Total diabetes	1370 (93%)	1850 (91%)	3220 (92%)
Non-diabetic 'Main diagnosis'	109 (7%)	184 (9%)	293 (8%)
Grand total	1479 (42%)	2034 (58%)	3513 (100%)

LCW = Leicester Clinical Workstation

- Free clinical text notes.
- All data from each patient contact, which is amalgamated into a Microsoft Word document to record all nurse specialist activity, incorporating clinical notes and the educational/problem checklist. This document is visible to all workstation users in the hospital who have access to that particular patient's record as part of the clinical workstation EPR.

Implementation, staffing and activity

Live data collection commenced on 2 July 2001 and involved 8 staff (4 H-grade, 2 G-grade, 2 F-grade).

The weekly workload consisted of 5.5 medical clinics (supported by 2 DSNs per clinic), 1 antenatal clinic (1 DSN), 1 foot clinic (3 DSNs), 1 monthly andrology clinic (2 DSNs) and 1 monthly young adult clinic (1 DSN). In addition, all DSNs undertook 0.5–1.5 nurse advisory clinics per week. Urgent referrals were seen on the same day or within 24 hours. Each DSN participated in the helpline rota, providing patient-instigated telephone support. Ward activity was provided by 5 DSNs (4 WTEs) and covered all wards and departments in LRI.

Audit

After 9 months of using the LCW, an audit was undertaken to test the use of the system, critically evaluate patient activity and DSN service workload and provide baseline data for service development and workforce planning. The data represented all inpatient and outpatient contact activity undertaken on the LRI site only, but did not represent the complete workload of the DSN team, excluding activity in some specialist clinics and peripheral community clinics. Standard clinical workstation reporting tools exported relevant data into a Microsoft Excel spreadsheet for more detailed analysis.

Results

From 2 July 2001–31 March 2002 a total of 3513 patients were seen in the department. Of these, 1479 patients (48% female, 52% male) were seen by the DSN for a total of 4868 contacts. Main diagnosis recorded in the workstation is shown in Table 1. Of the 3513 patients, 1479 (42.1%) had been seen by the DSN team and 46.7% had had an annual review since 31 March 2001. The remainder of the analysis relates to the 1479 patients who had DSN contact recorded.

Of the 1479 patients seen, outpatient activity featured highly, accounting for 48% of the workload (Table 2). A significant 30% of the workload was via telephone contact; 22% of contacts took place on the wards, with 2 DSNs providing cover every morning and afternoon; and 1% of contacts were home visits or type not recorded (home visit referrals that are not instigated by LRI are not electronically recorded).

The patient contact location identified the workload spread and enabled current workforce deployment to be reassessed. A drastic improvement in service to the wards was achieved through allocation of dedicated staff, increasing from 2% of contacts on an earlier manual audit. This was achieved by appointing dedicated staff, identifying changing trends and providing

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evidence of working towards achieving NSF Standard 8 (inpatient care). This does not measure quality of care but rather ease of patient access to expert care/advice.

The reason for patient contact (Table 2) identified four major areas of activity and was cross-referenced with its location. Patient education represented a substantial proportion of the DSN workload, accounting for 46% overall, and also being implicated in the 35% of problem solving with an educational element. These data prompted consideration of the way that care was delivered – mainly on a one-to-one basis in the outpatient department (OPD). Timely implementation of group education for appropriate patient groups was thought to be time-effective and to standardise care, thus encouraging equity of care in the spirit of the NSF for Diabetes.

The episode timing of patient contact (first, ongoing or last contact in an episode of DSN care) revealed some unexpected data (Table 3). The majority (90%) of initial contacts were made in outpatient clinics or wards. Ongoing contacts averaged 66% of all episodes of patient contact, but 81% of all telephone contacts. The escalating number of patients receiving ongoing care without commensurate number of discharges (4%) indicated a need to look at the reasons for this and consider how the problem might be addressed. It would be expected that many patients would not be receiving DSN care over a 9-month period in a single episode of care. Reasons for this may have been: the lack of a facility to record a single consultation without follow-up; reactive as opposed to proactive education for self-care; a coping mechanism for increasing patient demand/number; and inequity of diabetes services in primary care and thus DSN reluctance to discharge.

Patient contacts were spread unevenly through the week: Monday 29.7%, Tuesday 20.1%, Wednesday 23.4%, Thursday 10.3% and Friday 16.5%. The indication of workload spread and time availability can facilitate the planning of new services, after absolute commitments, including peripheral clinics, have been taken into consideration. It can also promote more effective use of new and current staff.

The main treatment action from each contact was recorded in the workstation. As expected, this confirmed that approximately 50% of activity centred on insulin therapy. This probably reflects tighter criteria for adequate glycaemic control leading to transfer to insulin, and may reflect a higher rate of referral to secondary care. Identifying trends in subsequent audits may be useful when looking at changing roles and educational needs across the primary/secondary care interface.

Educational and problem-solving categories were ranked in order of highest to lowest activity levels. Many of the current data were as expected, with notable exceptions which were scrutinised. This dataset will provide baseline data for future benchmarking activity against standards. For example, the initial consultation for starting insulin therapy involves specific and

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Table 2. Main reason for patient contact in each clinical location

	Outpatient visit	Ward consultation	Telephone contact	Other/Not recorded	Total (% reason for contact)
Education	918 (39.1%)	599 (56.9%)	702 (48.8%)	2 (6.7%)	2221 (45.6%)
Education + problem	1165 (49.6%)	240 (22.8%)	266 (18.5%)	11 (36.7%)	1682 (34.6%)
Problem solving	144 (6.1%)	145 (13.8%)	338 (23.5%)	3 (10.0%)	630 (12.9%)
New insulin review	117 (5.0%)	63 (6.0%)	126 (8.8%)	1 (3.3%)	307 (6.3%)
Staff query only	2 (0.1%)	5 (0.5%)	7 (0.5%)	1 (3.3%)	15 (0.3%)
Not recorded	1 (0.0%)	0 (0.0%)	0 (0.0%)	12 (40.0%)	13 (0.3%)
Total (% type of contact)	**2347 (48.2%)**	**1052 (21.6%)**	**1439 (29.6%)**	**30 (0.6%)**	**4868 (100.0%)**

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1 Cohesive teamwork, with positive support and encouragement was fundamental to success.

2 The audit provided the diabetes service with electronically generated data.

3 Advantages of prompt written and verbal communication outweigh the disadvantage of spending more time electronically recording information.

4 Although the initial outlay was costly, the investment is likely to prove invaluable.

Table 3. Distribution of first, ongoing and last contacts

	First contact	Ongoing contact	Last contact	Not recorded	Total (% type of contact)
Outpatient visit	621 (26.5%)	1449 (61.7%)	81 (3.5%)	196 (8.4%)	2347 (48.2%)
Ward consultation	370 (35.2%)	565 (53.7%)	46 (4.4%)	71 (6.7%)	1052 (21.6%)
Telephone contact	104 (7.2%)	1171 (81.4%)	85 (5.9%)	79 (5.5%)	1439 (29.6%)
Other/Not recorded	3 (10.0%)	9 (30.0%)	1 (3.3%)	17 (56.7%)	30 (0.6%)
Total (% first/ ongoing/last)	**1098 (22.6%)**	**3194 (65.6%)**	**213 (4.4%)**	**363 (7.5%)**	**4868 (100%)**

essential educational categories to ensure safe management and reduce risk, the gold standard being 100%.

Discussion

The reconfiguration project presented a major cultural change for the DSN team. Cohesive teamwork, with positive support and encouragement, both during and after the training period, was fundamental to its successful implementation.

The audit highlighted some areas of the DSN programme that needed minor modification, but for the first time provided the diabetes service with electronically generated data. This provided baseline information on DSN workload, clinical and educational activity, and how and where the service is delivered, and identified areas for improvement and further assessment. This is supportive of both quality initiatives and the clinical governance agenda.

Our multidisciplinary team now has access to current DSN information on patients' clinical and educational status and any current problems or concerns. This supports an informed and improved quality consultation for the patient, as well as promoting team communication.

Our information skills are continuously improving and are reflected in the quality of our records. These transferable skills support other areas of the DSN's role, such as research.

Access to information by our primary care colleagues has been facilitated by the computerised documents, which can be distributed promptly. Telephone consultations for both patients and professionals are more reliable with instant access to information. The advantages of prompt written and verbal communication outweigh the disadvantage of spending more time electronically recording information during patient consultation.

Resource requirements for the project were substantial and robust management support was essential in their acquisition. The costs involved purchase and configuration of computers, provision of network access, funding of the training and staff 'time out'. Although the initial outlay was costly, the investment is likely to prove invaluable and fundamental to supporting successful implementation of the NSF for Diabetes (Department of Health, 2001b).

Conclusion

In this paper we have described how a change project for a DSN team was successfully implemented, using external facilitation and robust project management, resulting in an electronic record of the DSN activities and care which is accessible to all members of the diabetes team. We described the results of a patient activity and DSN service workload audit which was easily analysed and represents an accurate picture of the care delivered.

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