

# The development of an electronic diabetes nursing record

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## Introduction

Diabetes nurses strive to provide good quality care to people with diabetes. The Scottish Executive has demonstrated its commitment to diabetes care through the Scottish Diabetes Framework (Scottish Executive, 2002). The internet-based managed clinical network (MCN) system provides information to patients and healthcare professionals about all aspects of diabetes care. The development of MCNs has allowed nurses to pilot and develop new ways of recording information. The MCN has provided improved care through systematic and standardised methods of recording information, better multidisciplinary communication and has had a major impact on patient care, satisfaction, empowerment and interaction.

Tayside is a Scottish health board that provides healthcare to a population of 385 000 people in both urban and rural regions. Tayside is served by two acute hospitals, a number of cottage hospitals and 74 general practices. A total of 13 126 people with diabetes are cared for in three main areas: Angus; Dundee; and Perth and Kinross. A team of eight diabetes nurses deliver specialist nursing care throughout Tayside.

A variety of different care models exist across the region. In the more rural areas (Angus, Perth and Kinross) people with type 2 diabetes are more likely to have their care delivered by primary care. The city population of Dundee are still mainly seen in secondary care. However, patients are slowly being transferred to primary care in collaboration with primary care staff. This will take time, negotiation, support and education to be effective.

## From DARTs to SCI-DC

A model for a managed clinical network was outlined and developed following the development of a research project in 1996 (the Diabetes Audit and Research in Tayside; DARTs) and an acute services review in 1998. The managed clinical network was underpinned by a web-based clinical information system, now known as the Scottish Care Information-

Diabetes Collaboration (SCI-DC). SCI-DC is a collaboration between the Scottish Executive Health Department (SEHD) and NHS Scotland supporting agencies, including trusts, boards and primary care. (For more information please see [www.show.scot.nhs.uk](http://www.show.scot.nhs.uk).) The system is funded by the SEHD until April 2006, and the minister for health recently announced an additional £1.5 million over the next year to assist the development of managed clinical networks across Scotland. (For more information see [www.diabetesinscotland.org](http://www.diabetesinscotland.org).)

SCI-DC delivers information to both patients and healthcare professionals and is accessed through the website [www.diabetes-healthnet.ac.uk](http://www.diabetes-healthnet.ac.uk). Healthcare professionals have additional access to two password-protected secure sites which contain:

- The diabetes handbook which contains evidence-based protocols for all aspects of diabetes care. Primary and secondary care have access to the handbook.
- The clinical dataset which provides a number of screens used by multiprofessional teams in primary and secondary care across Tayside.

## Developing an electronic diabetes nursing record

The Clinical Standards Board for Scotland (CSBS) highlighted the importance of

## ARTICLE POINTS

**1** A model for a managed clinical network was developed in Tayside to improve the care of people with diabetes.

**2** The Scottish Care Information-Diabetes Collaboration (SCI-DC) supports patient care and provides a robust audit facility.

**3** The DSN screen forms one screen within the SCI-DC and was developed by DSNs with IT support in 2001.

**4** Initial problems that were encountered have been largely resolved and fulltime information technology support introduced.

**5** The SCI-DC continues to evolve and to be updated with relevant information.

## KEY WORDS

- Electronic diabetes nursing record
- Managed clinical network
- Interaction
- Empowerment

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1 The role of the DSN has been broadly categorised as that of a clinician, advisor, educator and researcher.

2 Nurses are one of the largest groups of healthcare professionals delivering healthcare information, but as a group have had a minimal role in system design.

3 The continued progression of the managed clinical network allows nurses to design, pilot and develop new systems of recording patient nursing information.

improved performance and prevention of problems through systematic activities such as documentation (2001). The recently published competency framework for the care of people with diabetes (NHS Education for Scotland; 2003) discussed the importance of communication and methods of record keeping by multidisciplinary teams.

The dynamic nature of the nursing role in improving health and delivering health services is clearly reflected in the Strategy for Nursing and Midwifery in Scotland (Scottish Executive, 2001a). The role of the DSN has been broadly categorised as that of a clinician, advisor, educator and researcher (O'Brien and Furneaux, 2001). Although this was a limited and minimal analysis, it provides a starting point when considering the key components of the DSN role. Kelsey (1991) further explores these categories in relation to the opportunities for the use of a computer-based record keeping system.

Information technology (IT) in healthcare is often not used to its maximum potential. Nurses are one of the largest groups of healthcare professionals delivering healthcare information, but as a group have had a minimal role in system design (Hay,

1994). This may have been because there has been a preoccupation with value and quality of nursing records, largely driven by professional, legal and ethical issues (Nursing and Midwifery Council, 2002). The continued progression of the managed clinical network, now being developed in many areas of chronic disease, allows nurses to design, pilot and develop new systems of recording patient nursing information.

SCI-DC: a managed clinical network

The SCI-DC is a managed clinical network that is used on a daily basis by healthcare professionals in Tayside. Data sources are independent and include primary and secondary care records, morbidity rates, records of all hospital admissions, a biochemistry database, a mobile eye screening service and encashed prescriptions (Brennan et al, 2002).

All patients with diabetes in Tayside have a unique 10 digit number known as a CHI (community health index), which identifies them through all episodes of care wherever in the region it is delivered. The system not only supports patient care, but also provides a robust audit facility. The clinical dataset contains

Figure 1. The patient summary screen

a number of screens: the patient summary screen, the registration screen, the foot screen, the letters comments screen and the DSN screen:

- The patient summary screen contains the latest clinical data for each patient, including biochemistry, retinal screening, cardiovascular risk factors and foot assessment information (Figure 1).
- The registration screen allows healthcare professionals to register patients on the system.
- The foot screen allows healthcare professionals to record foot screening results consistently. However, previously recorded information cannot at this point be recalled.
- The letters/comments screen allows access to clinic letters, DSN contacts and mobile eye screening information.
- The DSN screen is used by all diabetes nurses in Tayside to record data consistently on a common dataset (Figure 2). The dataset includes information about the date of contact, reason for contact, referral pathway and where and why the patient is seen. Diabetes medication and dosage can be entered and changed as required. The type of meter, pen device and needle

size used by the patient can be accessed, but only if it has been recorded accurately by the nurse caring for the patient. Data is held on the patient's electronic record and can be viewed the next working day. Any mistakes that are made have to be rectified through IT, and cannot be corrected by the nurse once the form has been submitted. This can be a problem occasionally.

**Development of the DSN screen**

The DSN screen forms one screen within the SCI-DC and was developed by DSNs with IT support in 2001. All DSNs for adults had input to the development of the screen and decided on key features that should be included. A small number liaised with IT; this group was formed democratically, according to who was able to make the meeting. Paediatric DSNs were involved in one consultation, but are still working on their screen, as their needs are different.

The DSN screen was piloted by 10 nurses over a 3 month period and has now largely replaced all paper records for people with diabetes in Tayside. Paper records are kept for small numbers of patients, usually without a CHI number

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3 The DSN screen is used by all diabetes nurses in Tayside to record data consistently on a common dataset.

4 Any mistakes that are made have to be rectified through IT, and cannot be corrected by the nurse once the form has been submitted.

The screenshot shows the 'Diabetes Specialist Nurse Review Form' interface. At the top, it has the SCI-DC logo and NHS Tayside branding. The form is divided into several sections:

- Patient Details:** Includes fields for Contact Date (23/08/2002), Patient ID, Official Practice Health Board Number, Hospital ID, Surname (SMITH), Forename (JEAN), Home Phone Number, Work Phone Number (01382 660111), GP Name (Dr ANDREW JONES), GP Phone Number (01382 461588), GP Address (Grove Park Health Centre, Dundee), Diabetes Type (Type 2), New Referral Source (Practice Nurse), Reason for Contact (Prescription Adjustment), and Contact Location (Telephone).
- Medication Information:** A table with columns for Meal Type, Insulin - Dose, Tablets - Dose, Start Date, and BG Level (Min - Max). Rows include Breakfast, Mid-Day, Evening Meal, and Before Bed. Each row has dropdown menus for insulin and tablet types, and input fields for doses and start dates.
- Medication Details:** Fields for BG Meter (Glucomen), Insulin Pens (Novo Disposable Pen), Cartridge (Please Select), and Needle Size (NovoFine 8mm).
- Education:** Two dropdown menus for 'Web Leaflets Given / Discussed' and 'DSN Patient Education Discussed'.
- Clinical Comments:** A large text area for notes, with a character count of 0.

At the bottom, there are 'Submit Specialist Nurse Review Form' and 'Reset' buttons.

Figure 2. The DSN screen

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**1** Keeping records of any clinical advice given to patients is a legal requirement and is one of the tasks that is carried out by DSNs.

**2** Clinical data is regularly updated and can be used as an interactive consultation with the patient.

**3** Between December 2001 and March 2002, 13 080 patient contact forms were submitted for a total of 3179 patients.

**4** Each DSN had, and probably still has, a slightly different approach to recording data, but the common dataset prevents major deviation.

from outside the area.

The inclusion of all relevant patient information has been attempted. Education and patient information leaflets given to patients can be recorded. A free text box is available for other comments and can be viewed and recalled through the letters page. Information can be recorded through either drop down predetermined lists or a free text box. Use of the established entry fields is encouraged for audit and consistency purposes.

### Considerations for nursing practice

Keeping records of any clinical advice given to patients is a legal requirement and is one of the tasks that is carried out by DSNs. It was hoped that by the development of an online DSN record an opportunity would be provided for:

- Better articulation of nursing care and practice in a systematic way, promoting effective multidisciplinary communication.
- A major impact on patient care and satisfaction.

### Patient care and interaction

The system provides easy electronic access for all aspects of care. Clinic letters and DSN comments from across Tayside can be obtained quickly and easily on almost any computer in the trust. Clinical data is regularly updated and can be used as an interactive consultation with the patient. Patient data recorded, e.g. cholesterol and HbA<sub>1c</sub> results, can be shared with the patient, either as a graph or list. Non-target range results are highlighted in red for easy identification. Brink et al (2001) suggest that the documentation of a series of medical parameters, as previously described, allows for the identification of trends which may lead to inexpensive positive interventions. These interventions may include education, drug therapy and/or counselling.

Optimal outcomes are the result of a joint effort between healthcare professionals and people with diabetes, such as problem solving, identification of barriers to change and goal setting (Jenkins, 2003). Use of the system as an

interactive tool with the patient can help to provide up-to-date, visual and factual knowledge about their diabetes, which may help facilitate change, especially when setting patient-directed goals.

### Use of the system

Between December 2001 and March 2002, 13 080 patient contact forms were submitted for a total of 3179 patients. This represents an average of 4.1 forms per patient. The maximum number of forms for one individual patient was 76. The system continues to be used on a more frequent basis. Over 1900 operations are recorded on a weekly basis.

### Problems encountered

There have been a number of problems since the introduction of the system. Inequity of computer hardware across Tayside resulted in difficulties using the system and recording information. For a period of time, both paper and electronic records were kept, which increased the workload. Each DSN had, and probably still has, a slightly different approach to recording data, but the common dataset prevents major deviation.

People with diabetes who are new to the clinic, or who are newly diagnosed, have to be registered onto the system. Initially this was time consuming and irritating. New patient records cannot be accessed for 24 h after registration, which means accessing and completing the patient records the next day.

Large numbers of patients and busy clinics means that recall of information can often be difficult or delayed. In the early days many patients were not registered; as the system has developed this has become less of a problem. Familiarity with the system has improved use.

### Daily problems and IT support

Daily problems still exist:

- Records of patient telephone numbers and treatments need to be completed by the DSNs. Due to pressures on time, details are often unavailable which results in extra time spent trying

to find the information.

- The system has crashed on a number of occasions. This is usually for a short periods, but chaos is caused each time as no patient information can be accessed anywhere across the trust.
- Access to IT support in the early stages was difficult at times, and there were a number of problems accessing and registering patients. This has improved enormously and there is now a full time IT support worker based in Dundee who is dedicated to dealing with the daily running of the system and trouble shooting.

Most problems are now dealt with almost immediately and almost always within 24h. Reporting difficulties can be done either electronically or by telephone.

### Conclusion

The use of electronic nursing records as part of a managed clinical network has implications on many aspects of clinical practice for both patients and healthcare professionals. This type of initiative demonstrates how the boundaries of nursing practice can be expanded in response to the needs of the service in delivery of quality care to people with diabetes.

The NSF for Diabetes (2001) recommends the provision of ongoing support for people with diabetes, with better sharing of information and care plans between healthcare professionals and patients. Standard 3 discusses the importance of empowerment through the participation of patients in their own healthcare. Accurate clinical data shared with the person with diabetes can help to provide information allowing informed choice about healthcare options. The network lends another tool to help facilitate what can be a very difficult process. The interactive use of the system can help to provide easily accessed, up-to-date information for all members of the team, including the patient.

Recorded information is now more consistent, equitable and accurate. Reduced duplication and enhanced availability of information has improved

and is particularly useful if patients move within Tayside. The review forms are heavily used on a daily basis and the data is shared effectively throughout primary and secondary care. All patient contacts are tracked for audit purposes and paper records are now largely obsolete.

The system is constantly evolving. Glitches occur and changes are required, but the structure and content of the screen now remains relatively static. Regular updates about insulin types, meters and other information will always be required as they change frequently. However, one factor is constant; for the diabetes nursing team in Tayside a paper based system is a distant memory. ■

#### Acknowledgements

Scott Cunningham (IT) and the following DSNs from Tayside: Charlotte Anderson, Aileen Black, Jayne Cameron, Lesley Mathieson and Debbie Voight

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