

The SCI-DC experience



Duncan Stang



Scott Cunningham



Graham Leese

Duncan Stang is a Podiatrist and the National Diabetes Foot Co-ordinator for Scotland, Lanarkshire; Scott Cunningham is Technical Consultant for SCI-DC, Clinical Technology Centre; Graham Leese is a Consultant in Diabetes, Ninewells Hospital, Dundee.

SCI-DC (Scottish Care Information - Diabetes Collaboration) is the national suite of information technology (IT) systems designed to support the clinical care of people with diabetes in Scotland. SCI-DC provides secure, web-based access the shared patient records for diabetes.

SCI-DC began as the Diabetes Audit and Research in Tayside Study (DARTS) system and has evolved from a regional research and audit database to a core component of national diabetes service delivery. SCI-DC has now been implemented in all 14 health boards across Scotland.

Here, the authors provide an overview of the system, and look specifically at how the diabetic foot benefits from an integrated electronic diabetes registry.

Background

The Scottish Health Plan *Our National Health: A Plan For Action, A Plan For Change* (Scottish Executive Health Department [SEHD], 2000) identified diabetes as a priority condition for NHS Scotland. The SEHD accepted the recommendation of a national IT system based on collaborative development of the Lanarkshire Diabetes Hospital System, the DARTS system (Morris et al, 1997) and the Scottish Care Information programme – and so the SCI-DC Project was born.

In 2004, NHS Quality Improvement Scotland recommended that all health boards create plans to implement SCI-DC to support the management of people with diabetes. The strategic aims of the project have been shaped over time by the Scottish Diabetes Framework (SEHD, 2002), a subsequent review (SEHD, 2004) and an action plan (SEHD, 2006).

SCI-DC in practice

To create a central repository for diabetes patient data, it is necessary to link (and draw

extracts from) the various databases holding information on the clinical management of people with diabetes. SCI-DC uses a combination of real-time and batch-processing interfaces to ensure information is available at the right place, at the right time, and only has to be entered once. Where individual results are recorded multiple times, a priority weighting marks the definitive record based on the relative rankings (Boyle and Cunningham, 2002).

The Community Health Index (CHI) number – NHS Scotland's unique patient identifier – is used to link all data recorded for a patient. This is a key component to ensure that a complete consolidated record is available, regardless of its original source (SEHD, 2005). Links have been made to SCI-DC from hospital clinics, laboratories, screening services, death registries and primary care facilities to feed data gathered at these locations into the one centrally managed record.

A format for recording patient data was defined by the SEHD's Information Services Division to improve coding and included a diabetes core dataset (SEHD, 2003a) and a primary care subset (SEHD, 2003b). In addition to the clinical and health economic advantages, defining and coding these data items provides a common language or "currency" that allows comparison, audit and benchmarking.

SCI-DC provides two types of audit:

- User audits. These audits provide a history of all SCI-DC activities performed by a given user. This monitors trends and can be used to flag potential misuse of SCI-DC.
- Clinical audit. These include static and some limited *ad hoc* audit on key diabetes indicators. Data for several national and regional audits are easily accessible through SCI-DC, including for the compulsory annual Scottish Diabetes Survey (Scottish Diabetes

Survey Monitoring Group, 2009) and the General Medical Services contract indicators (NHS Primary Care Commissioning, 2010) that determine GP payments. Using SCI-DC allows data missing from GP systems to be identified, and can highlight results that are more relevant or current than those known to exist in primary care records.

Designed for use in the day-to-day clinical management of diabetes

SCI-DC is an example of a bottom-up, clinically driven project that is successful because it delivers clinically useful tools to support the care of people with diabetes.

SCI-DC can generate an overview of an individual patient's record – current and historical – broken down into sub-section on biochemistry, eye/foot screening, lifestyle and so on (Figure 1a). Clinicians using the system can view lists of the people under their care, sorted both by diabetes type and complication category (Figure 1b). Graphs can be generated to view trends over time, allow benchmarking of averages and identification of people falling outside of targets (e.g. HbA_{1c}). Population data can also be summarised, as shown in Figure 1c.

Although SCI-DC has been receiving data from existing GP systems, such as Ascribe (www.ascribe.com), EMIS (Egton Medical Information Systems; www.emis-online.com), GPASS (GP Administration System for Scotland; www.gpass.scot.nhs.uk) and Vision (www.inps.co.uk) for several years, the main obstacle in the roll-out and adoption of the system across NHS Scotland has been SCI-DC's inability to transfer data back in the opposite direction. Back population of data is essential, making it necessary for users to enter data only once and allowing General Medical Services contract indicators and Quality Outcomes Framework requirements to be met. This back population issue is now being addressed and will encourage wider use of the system and fulfil the strategic objective of a single point of data entry for SCI-DC.

SCI-DC and screening the diabetic foot

Diabetic foot screening is the cornerstone of good diabetic foot care and it is recommended that screening be carried out annually (SIGN, 2001; NICE, 2004). The object of carrying out diabetic foot screening is to assess a person with diabetes' risk of developing foot problems, assign them a risk status and implement a treatment and management plan in a needs-related way.

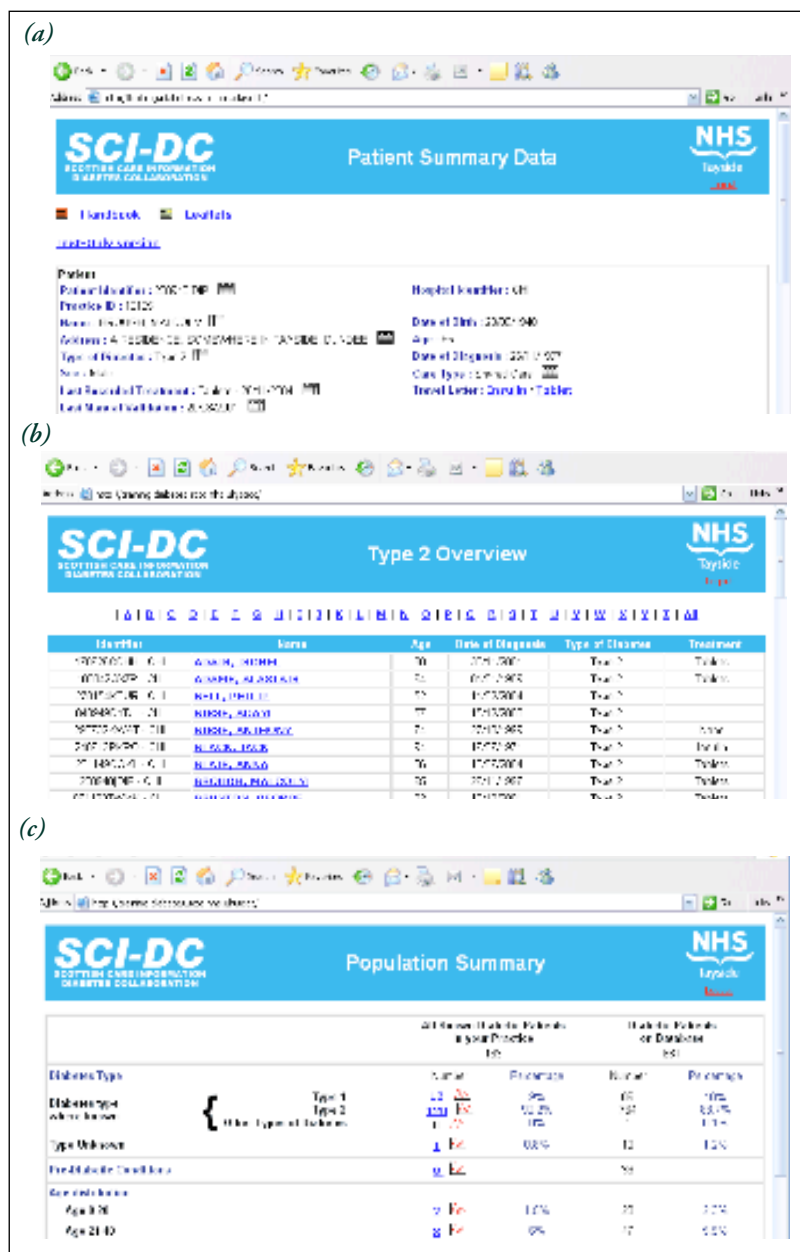


Figure 1. Screen shots from SCI-DC of (a) an individual patient summary, (b) type 2 diabetes patient group overview and (c) regional population comparison of diabetes data.

“When the required information is entered, the [SCI-DC foot screening] tool automatically calculates a person’s foot risk status and displays recommended action based on that level of risk.”

Carrying out of a foot examination that does not take into account the known risk factors for diabetic foot disease, does not conclude with the assignment of a risk status, and is not followed-up by the implementation of a treatment plan appropriate to the risk status, is unlikely to produce a satisfactory outcome.

SCI-DC includes a foot-screening tool. The tool takes into account the major factors influencing diabetic foot disease risk (i.e. absence of foot pulses, inability to feel a 10-g monofilament, presence of significant structural deformity or a significant callus, previous ulceration). When the required information is entered, the tool automatically calculates a person’s foot risk status and displays recommended action based on that level of risk (Figure 2).

The foot-screening tool has proven effective in accurately determining foot risk status (Leese et al, 2006) and is standardising evidence-based foot screening across NHS Scotland. The tool simplifies the data recording and risk calculation aspects of the screening process, with the page taking only seconds to complete.

In 2007, 25% of people with diagnosed diabetes in Scotland had their foot-screening data and risk status recorded on SCI-DC; as this article went to press, that figure had risen to 56%, suggesting that the system is being actively adopted (Foot Action Group, 2010). It is expected that more than 75% of people with diagnosed diabetes in Scotland will have their foot-screening data and risk status recorded on SCI-DC in 2010.

The SCI is the limit

Several new features to enhance SCI-DC are currently being developed. A number of these are detailed in *Scottish Diabetes Framework: Diabetes Action Plan* (SEHD, 2006).

One new feature will be a foot ulcer management record within SCI-DC, developed with the guidance of the Scottish Foot Action Group. The record’s design is now complete and it will be rolled-out in Lanarkshire during 2010. Once the system is up and running in Lanarkshire, the Scottish Foot Action Group will work towards a nation-wide roll-out.

Figure 2. A screen shot from SCI-DC showing the foot-screening tool. Data on a range of risk-modifying factors are entered by the clinician and a risk score is automatically calculated. Advice on management and the need for referral is provided.



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The ulcer management page will allow SCI-DC to host a comprehensive record of an episode of ulceration. The record is split into three sections: (i) initial assessment; (ii) treatment; and (iii) outcome. The record will be accessible both for primary and secondary care clinicians involved in the management of that person, ensuring consistency of treatment wherever it is being carried out. The system also has the ability to display serial digital photographs of foot ulceration and guidance on onward referral.

A key longer-term goal is for SCI-DC to provide people with diabetes, at their request, with access to elements of their record. By employing systems similar to those used in electronic banking, it will be possible to host a secure site that offers appropriate patient information and advice in an accessible language. This development is currently being researched by NHS Scotland.

An update and consolidation of existing SCI-DC systems is also under way. This will result in greater consistency of layout and real-time data updates that reduce periods of down-time when data are being batch-processed.

The system used by SCI-DC was designed to provide IT support for the management of long-term conditions. It is hoped that in the future, the lessons learned through the SCI-DC experience will inform the use of such technology to manage care for conditions other than diabetes.

Conclusions

SCI-DC, a shared diabetes patient record, is being used securely in every Scottish health board as part of day-to-day clinical management. SCI-DC gives clinicians access to clinical information on their patients with diabetes from a range of healthcare settings, episodes of care and a variety of clinicians. More broadly, SCI-DC generates a picture of diabetes and its management at local, regional and national levels that is used to evaluate services, observe change and make provision for the future.

The comprehensiveness and success of SCI-DC is a reflection of the significant investment in the project by a range of stakeholders – especially clinicians. Although many inquiries about the system are received, it remains available only in Scotland. As news of the success of the system spreads it may be adopted in other areas. ■

Note to the reader: Please be aware that the screen shots that appear in Figures 1–2 are purely fictional entries. They do not represent data relating to a real patient record.

DS, SC, GL.

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