Northern Ireland – Regional Electronic Patient Record for Diabetes

a report by
Hicom Technology

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Northern Ireland has approximately 40,000 people who have been diagnosed with diabetes and it is estimated that a further 25,000 people are as yet undiagnosed.

The Ulster community and hospitals National Health Service (NHS) trust established a diabetes forum in Belfast, Northern Ireland in 1998. The primary objective of the forum was to advance patient care through the development of a fully integrated district wide diabetes care network. The district wide diabetes service covers 60 General Practioners (GPs) surgeries (most of which provide dedicated diabetes clinics) and four hospital/community based general diabetes clinics each week. In addition there is a weekly specialist diabetes pregnancy clinic and a monthly adolescent/young adult diabetes clinic. The service is supported by a Network diabetes facilitator, hospital and community based diabetes specialist Nurses, Dieticians, Podiatrists, Pharmacists, a Retinal screening service and a Clinical Psychologist. In order to achieve comprehensive care management, the district wide diabetes service was required to regularly collect and maintain patient data, and to share information with all appropriate healthcare professionals at all levels, working towards the establishment of a comprehensive diabetes patient register.

The rising prevalence of diabetes in the population and the increased complexity of patient care management, presented clinicians and healthcare managers in Northern Ireland with a serious challenge in the delivery and planning of care services. Dr Roy Harper (Consultant Diabetologist) was a key member of the multidisciplinary working group responsible for commissioning DIAMOND (a Hicom Technology system) into the Ulster Hospital in 1999. Dr Harper was convinced that the provision of effective care across a large patient population (catchment of 270,000 people) would be significantly enhanced when supported by a comprehensive, robust clinical information system. However, it was emphasised at an early stage that any such system would have to be configured so as to be complimentary to the clinical process and must not become an administrative burden to busy clinicians. The rationale underpinning this view was based in the belief that clinicians can make better decisions on patient care when they have all the relevant information easily available to them at the point of care.

The first step included the installation of DIAMOND as a clinical information system followed by the transference of historic data into DIAMOND from an existing legacy system. The next phase saw the development of electronic data interfaces with the hospital's patient administration system (PAS) and pathology systems enabling information relevant to patients with diabetes to be automatically uploaded into DIAMOND. Once full integration within the hospital environment was achieved the next objective was to roll-out DIAMOND to community and primary Care services, thereby expanding the system into a fully inclusive local register.

Following the initial installation of DIAMOND Dr Harper and other colleagues including Dr David McCance (Consultant Diabetologist at The Royal Victoria Hospital, Belfast) embarked on a project that led to the implementation of DIAMOND into a further six hospitals in Northern Ireland. This early work has paved the way towards a province-wide diabetes register with the expansion of the DIAMOND user base to include 12 Acute hospitals and one community trust.

Hicom Technology, in partnership with GP system suppliers, developed a ground breaking electronic data interchange (EDI) between GP systems and DIAMOND using extensible markup language (XML) technology. In addition, DIAMOND has also been developed as a web-enabled system for remote access by GPs across the region and for use at the point of patient care. DIAMOND continues to evolve and through the utilisation of new technologies, additional functionality has been made available to clinicians including hand-held devices such as tablet PCs, laptops and personal digital assistants (PDAs) which enables the seamless exchange of information between professionals. These

developments have allowed all contacts (telephone/email/letter/SMS text messaging) with diabetes patients to be appropriately recorded. It is increasingly common for clinicians to use a tablet PC (in a wireless hospital environment) when conducting ward rounds and clinics as Dr Harper commented:

> *"The tablet PC is very discreet and does not intrude upon the doctor-patient relationship. Using DIAMOND at the point of patient care allows me to review all the information relevant to each patient and thereby better inform decisions on medication and care planning. I can also enter realtime information onto the system during the consultation and use the risk modelling tools for patient education. DIAMOND allows me to respond quickly to any deterioration in a patient's condition and to notify treatment changes to colleagues at the press of a button. In addition, ease of access to comprehensive patient information has enhanced the rate at which case based learning is assimilated…by using DIAMOND, we now learn so much faster."*

The development and availability of a comprehensive networked regional database containing standardised information, has also facilitated productive research and development work. This work has been conducted in collaboration with the University of Ulster and carried out by a number of PhD students. Innovations include the development of remote monitoring modules such as the Di@L-log interactive system. This system uses an automated, spoken voice-dialogue system to capture home monitored blood glucose and blood pressure data and link it to the electronic patient record with alerts generated as required. A GP reporting module has also been developed which offers individual GP practices a complete analysis of their patients' treatments, interventions and key disease indicators. In collaboration with the University of Ulster and Trinity College, Dublin, a group of PhD students are also applying data-mining techniques to interrogate the valuable patient data routinely captured by DIAMOND. The use of sophisticated intelligent data analysis techniques, it is hoped will allow discreet groups of local patients that share common disease presentation and treatment profiles to be mapped. This information may then be used to plot the probable disease progression of current and future patients and to therefore inform and modify treatment approaches and patterns in the future.

Northern Ireland has successfully implemented a workable and scalable regional diabetes register that provides clinicians with the information they need to more effectively treat patients, while also providing Public Health Managers with the data needed to plan services on a population basis.

Key Benefits

- Informed clinical decision-making based on accurate and timely information, that only needs to be recorded once;
- Improved communication between all healthcare professionals along the patient pathway due to the seamless sharing of information;
- Enhanced clinical risk management;
- Home monitoring and electronic upload of patient blood glucose levels;
- Enhanced patient education and involvement;
- Provision of information essential for the operational and strategic management of diabetes services;
- Comprehensive auditing of all diabetes patients and activities;
- Consistent service levels delivered to all patients;

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