

DISEASE MANAGEMENT

DIABETES

Wireless support to reduce costs and complications

The use of wireless technology has the potential of achieving better management of diabetes on a broad scale through near-real-time symptomatic surveillance, improved treatment compliance, a reduction of diabetes-associated complications and a significant decrease in the cost of long-term care of the chronically ill.

Introduction

A very substantial percentage of a country's annual healthcare budget, at least in the West, is spent on the management of chronic disease, of which one of the most rapidly growing is diabetes.

The World Health Organisation estimates that type-2 diabetes accounts for approximately 3 to 6% of a nation's entire healthcare budget.¹ In addition to the cost of the treatment itself, the financial burden of managing the many, severe complications of the disease needs also to be taken into account. What's more, over and above the direct medical costs, chronic disease carries with it other expenses, including indirect productivity-related costs.

In 2002, direct and indirect costs of diabetes were estimated at USD 132 billion for the US alone.² The bulk of the expenditure went to in-patient care, nursing-home care and medical consultation. It is thought that the real financial burden of the disease is even underestimated as intangible costs (e.g. psychosocial) and certain ancillary expenditures cannot be quantified. The cost estimates of course exclude undiagnosed cases of diabetes.

Compared to people without the disease, individuals with diabetes are more likely to need to have recourse to healthcare services other than those directly related to the treatment of their disease (e.g. ophthalmology). Medical expenditures per capita for people with diabetes amounted to USD 13 243 against USD 2560 for people that did not have the disease.²

The International Diabetes Federation (IDF) estimates the current number of adult people with diabetes to be 192 million worldwide and considers that this figure to rise to 333 million by 2025.¹

Daily Medical Support (DMS)

Two significant aspects of the management of a chronic disease are (1) ensuring that patients comply with their prescribed treatment and (2) close monitoring of symptoms.

Providing medical practitioners and patients with a mechanism that encourages treatment compliance and provides the means to monitor symptoms in real or near-real time would not only facilitate better management of diabetes, but would also reduce the costs related to the disease. Such a mechanism is made available through the Daily Medical Support (DMS) standard for communication that makes use of the RegPoint software module, a wireless disease management system operating via Personal Digital Assistants (PDAs) and mobile telephony. The concept, developed by the health services company RegPoint Ltd (www.RegPoint.eu), is specially designed to monitor chronic diseases.

The software operates with a General Packet Radio Service (GPRS), 3G or Code Division Multiple Access (CDMA) capable cell phone. The RegPoint Pocket software provides the possibility for encrypted, two-way communication between the mobile-phone user (i.e. the patient) and the healthcare provider. Patients receive discreet scheduled reminders for medication intake and are prompted to register symptoms and other significant events. The system updates a patient's health profile at regular intervals, several times a day. The data are automatically transferred and analysed by RegPoint Care software located on a server controlled by the appropriate healthcare provider or health authority. The Care module is programmed to flag all patient data that fall outside the pre-set limits and prompts the physician to review atypical data.

Two-way communication enables the physician to advise the patient. Since the patient's symptoms can be monitored in near-real time, treatment programmes can be amended as necessary. Prescribed medication can be more easily adapted to the individual requirements of the patient, and the physician is able to treat more patients in less time.

The DMS standard has received a lot of attention in Sweden where it has been successfully tested using PDAs to monitor patients with Parkinson's disease. Following the pilot study, physicians reported significantly better compliance to drug treatment and an objective improvement in the patients' medical condition. Physicians also reported that they spent less time discussing medication with their patients and were able to give them better medical support. Patients participating in the trial reported a significant improvement in their quality of life and a better compliance to treatment.

The next step is to make the solution available to a large and mobile population, in urban as well as rural areas. This is where mobile telephony comes in.

DMS for diabetes management

Diabetes is widespread in China and accounts for a substantial rise in costs for Chinese healthcare. Currently, it is estimated that there are some 23.8 million diabetes patients in China.³ It is anticipated that the Chinese healthcare system could reduce healthcare expenditure for diabetes by the equivalent of USD 3.3 billion annually by avoiding disease complications through effective disease management.

China already has a large number of mobile-phone users of whom approximately 5 million with GPRS capability. The market is currently growing at a rate of approximately 5 million a month, and it is estimated that in 2005 there will be over 360 million mobile telephone in China.

References

¹ International Diabetes Federation. Diabetes Atlas (2nd ed.). 2003.

² American Diabetes Association, Inc. 2003. Diabetes Care 26: 917-932
[<http://care.diabetesjournals.org>].

³ Professor Chen Jialun, Ruijin Hospital, Shanghai Second Medical Sciences University
[http://english.people.com.cn/200311/14/print20031114_128255.html].