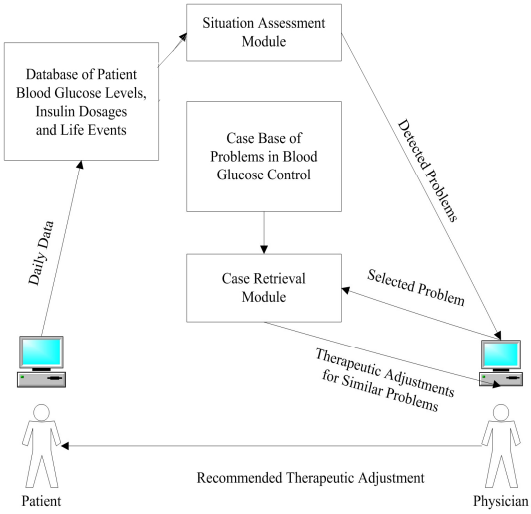
INTELLIGENT DECISION SUPPORT FOR DIABETES MANAGEMENT

TECHNOLOGY OVERVIEW

Case-based reasoning (CBR) is used to assist in managing patients with type 1 diabetes (DM-1) on insulin pump therapy. The ultimate goal is to provide intelligent decision support for managing patients with all forms of diabetes. A prototypical CBR system has been built to recognize problems in blood glucose control and to suggest appropriate therapeutic solutions. The prototype demonstrates the feasibility of automatically analyzing large volumes of patient blood glucose and life-event data, recognizing abnormal glucose trends and their causes, and proposing solutions to these problems. The software would initially be used by physicians who manage large numbers of patients with diabetes and have to manually review and interpret such data. Eventually, the technology could reside in glucose monitoring devices and insulin pumps to provide advice directly to patients in non-critical situations and to alert physicians in critical ones.



POTENTIAL FIELDS OF USE

All major pharmaceuticals companies and those manufacturing insulin pumps could have a strong interest in the technology. The US market for diabetes monitoring devices and therapies exceeded $11 billion in 2005, and is expected to grow by more than 10% through 2008. There are more than 1.1 million people in the US who suffer from Type I diabetes and around 160,00 are expected to use some kind of a glucose level monitoring device. Such patients usually have to monitor their glucose level twice daily and would greatly benefit from use of the technology.

BENEFIT ANALYSIS

The software has several benefits over existing technologies:

- Current technology collects and displays data. This software automatically analyzes data, detecting problems in blood glucose control and suggesting suitable therapeutic adjustments.
- Current technology is generic. This software remembers how individual patients respond to various life events, so that therapy can be tailored to the needs of each patient.
- With current technology, the majority of diabetes patients have inadequate glucose control. This technology may improve glucose control and variability, reducing the frequency and cost of diabetic complications.

STAGE OF DEVELOPMENT

The prototypical system contains a case base of 50 problems in blood glucose control with their associated therapeutic solutions. It automatically detects 12 types of blood glucose control problems commonly experienced by patients with diabetes. We are currently testing and expanding the system through two clinical studies involving 88 patients with type 1 diabetes on insulin pump therapy.

FUTURE DEVELOPMENT

Ongoing development is aimed at increasing the size of the case base, expanding the number and types of problems that can be automatically detected, and creating personal case bases to further individualize therapy. Future plans include extending the software to all types of diabetes and incorporating the software in patient devices for daily decision making support.

LICENSING OPPORTUNITIES

A patent for this technology has been filed. Licensing opportunities are available.

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