Development of A Web-Based Diabetes Patient Management Tool

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Abstract
Diabetes is a common disease in the society. To optimize patient care and compliance with the American Diabetes Association (ADA) testing guidelines is the important process for diabetes patients. In this project, a Web-based patient diseases management program is developed in which the nurse practitioners would regularly track diabetes patients clinical information and contact the patients who have not been checked in some time, have not had certain screening tests done, have not achieved good control of their diabetes, to determine appropriate follow-up.

Introduction
Diabetes is a serious chronic disease, over 18 million Americans have diabetes and another 16 million have pre-diabetes. Taking good care of diabetes will help patients avoid the health problems diabetes can cause such as: heart disease and stroke, eye disease that can lead to vision problems or even going blind, nerve damage that can cause hands and feet to feel numb or tingle and that can lead to loss of a foot or a leg, kidney problems and gum disease and loss of teeth.

In order to optimize diabetes patient care and follow ADA’s guideline, nurse practitioners need to review each patient’s chart to determine appropriate follow-up. This is a time consuming process. Thus developing a patient disease management tool will help them to track diabetes patient medical information so that they can easily get the patient information and contact those patients who need clinical treatments and arrange appropriate follow-up.

System Description
Based on the clinic’s requirements, a Web-based patient diseases management tool is designed and developed for diabetes patient medical information tracking. The Diabetes Patient Management Tool uses a three-tier Web architecture and is developed with ASP.Net, Java Script, dynamic HTML and PL/SQL. The patient clinical information is stored in an Oracle Database through an EMR application (Logician). The application runs on MS IIS web server. Concerning of data privacy, confidentiality and security, the web site runs on the department intranet.

After login to the application page, users can input the time period and select disease type from the drop-down list. The application will generate a summary table first, which shows that the numbers of patients who have not had certain screening tests (HbA\textsubscript{1c}, Glycosylated Hemoglobin, LDL, Triglycerides, HDL, Microalbumin, Creatinine, Blood Pressure) done in 6 months, 9 months and 12 months; have not been checked with foot and eye examinations in a year; have not got flu vaccine between Sep. and end of Jan. of current fiscal year; have not ever got pneumovax immunization; have not took acetylsalicylic acid; have not achieved good control of their diabetes treatments based on ADA testing guidelines. The summary list also includes clinic average values for above test items.

Then user can click the links inside the summary table to get the detail information for each item, such as patient age, gender, address, phone number, last available test date and tested values, and the patient lists who have not achieved ADA goals. Nurse practitioners can use the information to contact patients and arrange appropriate follow-up for them.

Status Report
The Diabetes Patient Management Tool has been installed on the FCM Web server since July 2004 and runs on the department intranet. It is a convenient and easy using tool for clinic practitioners and clinic director to tracking diabetes patients’ clinical information. It pulls out all clinical information for diabetes patients who have not achieved good control of their diabetes treatments together. Nurse practitioners check patients’ medical information regularly and contact those patients who need clinical treatment and arrange appropriate follow-up for them; clinical director use medical summary information for clinical disease management.