

# Individualized Electronic Decision Support and Reminders Can Improve Diabetes Care in the Community

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## Purpose

Physicians and patients frequently miss opportunities to improve the quality of care of diabetes, primarily because of the complexity of managing many risk factors over many years with many other providers. Electronic decision support is a potential way to improve prescribing and quality of care.

Shared care, meaning patients and physicians sharing access to the patient's status compared to recommended targets, is thought to improve outcomes as are supportive reminders. Our objective was to rigorously evaluate whether an electronic medical record (EMR)-linked, individualized electronic diabetes tracker with automated telephone reminders could improve the quality of diabetes management in primary care.

## Methods

Community-based family physicians across Ontario who were already using EMRs in their practice, were recruited. Patient and physician versions of a Web-based diabetes tracker, the (COMPETE II Diabetes Tracker (CIIDT) system, were developed. The main tracker page showed all 13 monitoring variables – the patient's recent values, both process (when last checked) and outcome (the result), target values for process and outcome, and short advisory messages, with red/yellow/green highlighting to indicate urgency of review. Links to best evidence guidelines and patient resources were provided. The physician view appeared as an overlay in a corner of their own electronic medical record (N = 6 EMR products). Intervention patients were linked to a voice biometric-enabled automated telephone reminder system (ATRS) for medications, labs and visits. Consenting patients with diabetes were randomized to the CIIDT-ATRS intervention or usual care (neither). Since the study was relatively short (6 months follow-up), the primary outcome was a composite score of process quality – the quality of monitoring the variables compared to target. Secondary outcomes included clinical outcomes plus evaluations of the tracker and ATRS, and impact on health information privacy.

## Results

Forty-eight physicians (mean age (SD) = 45.2 (10.0), 38.2% female) were recruited and 511 patients (mean age (SD) = 60.3 (12.4), 49.6% female, 78 % completed high school) were randomized. Only 46.1% of patients used the Internet at least monthly so print versions of their recent information were sent to them prior to their physician visits. There were frequent technical problems with the Web-based tracker and a lack of data integration between the various EMRs and the tracker. Despite problems, the primary outcome of composite score of physician visits, and checks of blood pressure (BP), LDL cholesterol, HbA1C, microalbuminuria, BMI, feet and eyes, showed a highly statistically significant improvement in the intervention group compared to control ( $p < 0.0001$ ). There were also highly statistically significant improvements in actual blood pressure (-2.68 mm diastolic BP,  $p = 0.007$ ) and in HbA1C (-.2%,

p=0.001). 75.9% of intervention patients were as satisfied or more satisfied with their care since the use of the tracker system and 62.5% voted to continue to receive ATRS reminders. 22.4% of patients felt that, in general, the risk of possible loss of confidentiality outweighed the benefits that computers could bring to their health. Over the course of the study, physicians developed a more favourable attitude towards the benefits vs risks of computerized systems in healthcare.

### **Discussion**

Despite considerable technical challenges for both patients and physicians, we have demonstrated that the care of a complex chronic disease can be improved with electronic tracking and decision support for both physician and patient. This is one of the first randomized trial to demonstrate success in routine, community-based primary care.

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### **References**

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\* Dr Lee is deceased.