

## Improving Diabetes Care with Interactive Technology

Glasgow RE, Nutting PA, King DK, et al. A practical randomized trial to improve diabetes care. *J Gen Intern Med* 2004;19:1167–74.

### Study Overview

**Objective.** To evaluate a computer-assisted, patient-centered intervention to improve delivery of recommended diabetes services to patients in a variety of primary care practices.

**Design.** Cluster randomized controlled trial.

**Settings and participants.** 886 patients with type 2 diabetes under the care of 52 primary care physicians in Colorado participated in the Diabetes Priority Program (DPP). Physicians were randomized to the intervention or control group and stratified by size of practice and urban/rural settings.

**Main outcome measure.** Number of recommended laboratory screenings and recommended patient-centered care activities (ie, self-management goal setting, nutrition counseling, self glucose monitoring, patient satisfaction) completed.

**Main results.** The program was consistently implemented across heterogeneous practice settings, with 95% of patients receiving the computer-based interactive assessment. The program improved both the number of recommended laboratory assays (3.4 versus 3.1;  $P < 0.001$ ) and number of patient-centered aspects of diabetes care patients received (3.6 versus 3.2;  $P < 0.001$ ) as compared with those in control practices. Activities that increased most were foot examinations (follow-up rate of 80% versus 52%;  $P < 0.003$ ) and nutrition counseling (76% versus 52%;  $P < 0.001$ ).

**Conclusion.** Patients are willing to participate in a brief computer-assisted intervention that enhances the quality of diabetes care. This intervention can be consistently delivered across a spectrum of practice settings; however, physician participation needs to be encouraged.

### Commentary

The chasm between best practice and actual practice delivered for diabetes and other chronic illnesses has been well documented [1]. Numerous interventions to improve delivery of care have been studied, but few have been widely adopted [2]. To improve the chances of adoption, it has been suggested

that a successful intervention should be brief, fit into flow of the clinic visit, not increase physician time demands, and contribute to patient-provider interaction [3]. The DPP is such an intervention that centers around a computer-assisted patient self-assessment and includes patient-provider counseling and telephone follow-up. Using a previously described framework (RE-AIM), Glasgow and colleagues assessed the reach, effectiveness, adoption, and implementation of DPP in Colorado primary care practices [4].

Although patient participation reached 76% of those eligible, a representative analysis showed that nonparticipants tended to be older, Latino, poorer, and less educated, mirroring the digital divide (ie, the disparity in access and use of new information and communication tools) [5]. Effectiveness and patient-centered care improved from 8% to 14% over control and 4% to 32% over baseline, depending on the specific measure. However, adoption by physicians was dismally low, as only 52 physicians (4.9% of total 1059 eligible) participated. However, characteristics of participating physicians did not differ from the total sample. Common reasons cited by physicians for not participating were not enough time, competing demands, and not enough staff. Despite the low physician participation, implementation of DPP was successful across diverse clinic settings, with 95% of patients receiving the intervention and an 86.4% telephone follow-up rate.

The primary strength of this trial is the “practical clinical aspect,” in that the DPP was adopted by physicians who reflected the general provider population and was implemented across diverse clinical settings. Further strengths include randomization design, nesting of patients, and clustered analysis. Limitations include the lack of biological

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outcomes (eg, glycosylated hemoglobin, lipids), the absence of complete diabetes registry in every practice, and reliance on patient self-report for services received. Perhaps with the gradual adoption of electronic medical records, these limitations can be addressed and interventions such as the DPP can be implemented more broadly.

### Applications for Clinical Practice

A computer-assisted, patient-centered intervention to improve diabetes care can be successfully implemented in diverse clinical settings and leads to improvements in the quality of care as determined by process measures. Although improvements in outcomes have yet to be demonstrated, interventions such as the DPP may help physicians to better care for their diabetic patients.

*—Review by Mark S. Horng, MD*

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