

## Optimizing Secondary Prevention in Type 2 Diabetes

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### Description

Patient-specific prioritization of clinical guidelines is a promising innovation for complex patients, but the benefits and costs of this strategy have not been evaluated, and prioritization programs are not yet available for widespread use. This investigation was a modeling project within the large cluster of diseases and treatments that interact in persons with type 2 diabetes.

### Specific Aims

1. Use a computer simulation model, the Evidence-Based Medicine Integrator (EBMI), to simulate a trial comparing the use of a computer model to personalize and prioritize treatments with unprioritized adherence to written guidelines.
2. Simulate this comparison at two levels of clinical inertia, with high inertia set to approximate current behavior in the Kaiser Permanente medical care program and low inertia set at a level that might be induced by a powerful pay-for-performance scheme or by a strong institutional effort to maximize Healthcare Effectiveness Data and Information Set (HEDIS) scores.

### Findings

- Using computers to assist in personalizing treatment and setting treatment priorities is more cost-effective than following written treatment guidelines.
- A much larger increase in quality-adjusted life expectancy in diabetes could be obtained if physicians and patients worked harder and more quickly to recognize and treat high blood pressure, high levels of LDL-cholesterol and blood sugar, and thrombosis risk.

### Main Objective

Use a new kind of evidence-based computer simulation model, the Evidence-Based Medicine Integrator (EBMI) to conduct a simulated trial to compare use of a computer model to personalize and prioritize treatments with unprioritized adherence to written guidelines.

### Chronic Conditions Considered

Type 2 diabetes and a large cluster of comorbid conditions.

### Preventive Service Considered

This project did not address a specific clinical preventive service.

### Study Design, Data Sources & Sample Size

Evidence-based computer simulation model

Persons with type 2 diabetes mellitus

### Strategies Addressed from the HHS Strategic Framework on Multiple Chronic Conditions

- 1.A. Identify evidence-supported models
- 3.C. Address multiple chronic conditions in guidelines

## Optimizing Secondary Prevention in Type 2 Diabetes (Continued)

### Implications

Incorporating computer-assisted clinical prioritization into electronic health records and routine clinical practice could improve diabetes care, both in terms of results for patients and costs to patients and other purchasers of health insurance.

### Publications (as of September 2013)

Brown JM, Stewart JC, Stump TE, Callahan CM. Risk of coronary heart disease events over 15 years among older adults with depressive symptoms. *Am J Geriatr Psychiatry*. 2011 Aug;19(8):721-9.

Blum S, Vardi M, Brown JB, et al. Vitamin E reduces cardiovascular disease in individuals with diabetes mellitus and the haptoglobin 2-2 genotype. *Pharmacogenomics*. 2010 May;11(5):675-84.

Nichols GA, Gandra SR, Chiou CF, Anthony MS, Alexander-Bridges M, Brown JB. Successes and challenges of insulin therapy for type 2 diabetes in a managed-care setting. *Curr Med Res Opin*. Jan 2010; 26(1): 9-15.

### Posters and Presentations

Brown J. Economic simulation modeling for clinical care and policy. Presentation at: World Diabetes Congress; 2011 Dec 4-8; Dubai, United Arab Emirates.

Brown J. EBMI, an open-source disease-simulation approach that uses local data. Presentation at: Economics, Modeling and Diabetes: the Mt. Hood Five Challenge; 2010 Sept 18-19; Malmo, Sweden.