

Closing the Quality Gap: A Critical Analysis of Diabetes Care Strategies

Agency for Healthcare Research and Quality



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- Using evidence to improve health care.
- Improving health care outcomes through research.
- Transforming research into practice.



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Background

One in seven Americans either has been diagnosed with diabetes mellitus or is at a high risk of developing the disease. Diabetes is an endocrine disorder characterized by high blood sugar (hyperglycemia) and caused by an inability on the part of the pancreas to control blood sugar levels through production of the hormone insulin. It is the sixth leading cause of death in the United States and can lead to serious, long-term medical consequences in millions of people, including heart disease, hypertension, and blindness.

The total cost of diabetes in the United States is estimated at \$132 billion for 2002, including nearly \$91.8 billion in direct medical expenses and nearly \$40 billion in indirect costs related to disability, lost work productivity, and premature death.

Diabetes and its related complications often can be controlled with appropriate health care and patient self-management techniques. The Institute of Medicine's 2003 report, *Priority Areas for National Action: Transforming Health Care Quality*, identified diabetes as one of 20 priority conditions. These are conditions that disable a large

number of Americans and for which a strong body of clinical evidence has established best-practice treatment methods. The most common form of this disease—adult-onset, or type 2 diabetes—affects 90 to 95 percent of diabetics and has been linked to obesity. The incidence of type 2 diabetes was found to have increased by 33 percent from 1990 to 1998.

Research finds that many patients with diabetes cannot properly control their blood sugar, and others are not receiving an adequate level of overall care (annual glycosylated hemoglobin checks, retinal eye screening and foot screening, annual influenza immunizations, and blood lipid testing every 2 years). The difference between present treatment success rates and those thought to be achievable using best-practice guidelines, such as the diabetes best practices described in this report, is known as a *quality gap*. This diabetes quality gap is a source of growing concern for researchers and clinicians alike.

Evidence

These facts led the Agency for Healthcare Research and Quality



(AHRQ) to commission a study in 2003 of the scientific literature related to diabetes mellitus, in an attempt to translate research into practice and improve the overall standard of patient care. Findings from the diabetes study are being published as part of a new AHRQ Technical Review series, *Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies as Vol. 2: Diabetes Care*.

Researchers at the Stanford University–University of California at San Francisco Evidence-based Practice Center (EPC)¹ were asked to carefully examine all valid studies of attempts to improve the quality of type 2 diabetes treatment and patient care, focusing on nine quality improvement strategies. The researchers defined a *quality improvement (QI) strategy* as any tool or process aimed at reducing the quality gap for a group of patients typical of those seen in routine practice.

Examples of QI strategies include:

- Physician and patient reminder systems;
- Using a telephone, fax, or e-mail to transmit patient data from outpatient specialty clinics to the patient's primary care physician; and
- Continuing education for physicians and patients.

Target measures in the study included disease control (measuring blood plasma glucose levels and blood pressure) and provider adherence to best practice treatment guidelines (monitoring glycosylated hemoglobin; controlling hypertension; and routine

checking for heart disease- and diabetes-related complications such as organ shutdowns, painful nerve disease, and gradual blindness).

More than 3,000 journal articles and conference papers were initially considered for the diabetes study. This collection was first narrowed to 529 articles, and then to 126 articles, using strict study criteria established by the EPC researchers. Half of the resulting articles dealt solely with patient education or self-management; these may be reviewed as part of a later volume of the *Closing the Quality Gap* series. A final sample of 58 articles, reporting a total of 66 quality improvement comparisons, was used as the basis for this study. For further details about how the study was conducted, see *Vol. 1: Background and Methodology*.

Findings

The EPC concluded that using at least two quality improvement strategies provides a greater chance for success in controlling patient blood sugar levels than does using a single QI strategy. The same holds true, though to a lesser extent, for physician and care provider adherence to established best practice treatment guidelines. Providers who use a combination of two or more quality improvement strategies are more likely to conform to the highest standard of care in the treatment of patients with diabetes than are providers who rely on a single QI strategy. Based on a small number of studies, the researchers also did not find added benefit from the use

¹ AHRQ oversees 13 EPCs, which analyze and distill the essence of the scientific literature related to prominent medical conditions and issues that affect large numbers of Medicare or Medicaid users and that consume a significant share of health care resources. The contractor organizations operating the EPCs include universities, nonprofit research organizations, and health care organizations (<http://www.ahrq.gov/clinic/epc/>).

of a clinical information system.

At the same time, this study was unable to recommend any one quality improvement strategy as being clearly better than others in its approach to treating diabetes, or to the degree by which it improves patient outcomes.

The conclusions of the EPC literature survey are complicated by differences in the design of the various studies reported in the journal articles. In some cases, the reviewed studies that involved a small number of subjects reported a greater effect than did larger, better-designed studies of the same strategies. None of the articles described studies in which the change in treatment approach had no statistically significant effect. This suggests that the size of the effects of some QI strategies may have been overestimated because researchers and journals are more likely to publish studies showing a positive result, an effect called publication bias.

Future Research

There is a rich body of clinical evidence supporting current diabetes treatment methods, but the set of studies designed to help providers, patients, and policymakers improve the standard of care is not as strong. The quality improvement studies analyzed in this

report provide some direction, in terms of techniques for improving disease management and implementing best practices. But more research is needed if we are to close the quality gap and reduce the impact of this pervasive health threat.

AHRQ researchers and others throughout the health care community are continuing their investigations into strategies for improving patient outcomes. Those involved with this Technical Review series hope it will generate new ideas to increase the adoption of evidence-based clinical practices, while stimulating new studies and more advanced explorations into high-quality and affordable health care.

For More Information

For additional information on AHRQ's projects involving evidence-based treatment practices and quality improvements in the delivery of health care, visit the AHRQ Website (www.ahrq.gov) or contact:

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