

Missing Elements Revisited: Information Engineering for Managing Quality of Care for Patients with Diabetes

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Abstract

Introduction:

Advances in information technology offer new avenues for assembling data about diet and care regimens of diabetes patients “in the field.” This creates a challenge for their doctors and the diabetes care community—how to organize and use new data to produce better long-term outcomes for diabetes patients.

Methods:

iAbetics approaches the challenge as a quality management problem, drawing on total quality concepts, which in turn are grounded in application of the scientific method. We frame the diabetes patient’s quality-of-care problem as an ongoing scientific investigation aimed at quantifying and predicting relationships between specific care-management actions and their outcomes for individual patients in their ordinary course of life.

Results:

Framing diabetes quality-of-care management as a scientific investigation leads to a seven-step model termed “adaptive empirical iteration.” Adaptive empirical iteration is a deliberate process to perfect the patient’s choices, decisions, and actions in routine situations that make up most day-to-day life and to systematically adapt across differences in individual patients and/or changes in their physiology, diet, or environment. The architecture incorporates care-protocol management and version control, structured formats for data collection using mobile smart phones, statistical analysis on secure Web sites, tools for comparing alternative protocols, choice architecture technology to improve patient decisions, and information sharing for doctor review.

Conclusions:

Adaptive empirical iteration is a foundation for information architecture designed to systematically improve quality-of-care provided to diabetes patients who act as their own day-to-day care provider under supervision and with support from their doctor. The approach defines “must-have” capabilities for systems using new information technology to improve long-term outcomes for diabetes patients.

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Abbreviations: (app) application program, (BG) blood glucose, (HbA1c) hemoglobin A1c

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